

**SWAMI VIVEKANAND UNIVERSITY , SIRONJA,**

**SAGAR (M.P.)**



# **SYLLABUS**

**For**

**DIPLOMA IN CIVIL ENGG.**

**III & IV Semester**

**Swami Vivekanand University, Sironja Sagar  
2012-2013**



# Swami Vivekanand University Sagar (M.P.)

## Scheme of Examination

PROGRAMME NAME : Three Years Diploma in CIVIL ENGG

Name of Scheme : CGPA 2012-13

Implemented from Session JULY 2012-13

Scheme of Studies and Examinations for : THIRD SEMESTER

Exam Code:

COURSE CODE	s	PAPER CODE	THEORY COMPONENT								PRACTICAL COMPONENT					TOTAL CREDIT	GRAND TOTAL OF MARKS			
			LECTURES	CONTINUOUS EVALUATION		END OF THE TERM/ SEMESTER EVALUATION			THEORY CREDIT	PRACTICAL Hrs. Per Week	CONTINUOUS EVALUATION	END OF THE TERM/ SEMESTER EVALUATION			PRACTICAL CREDIT					
				Hrs. Per Week	TERM WORK QUIZ, ASSIGNMENT	MID TERM TEST (TWO)		THEORY PAPER				LAB. WORK QUIZ, ASSIGNMENT	PRACTICAL / ORAL EXAMINATION (VIVA)							
						I	II	NO.					MARKS	DURATION (Hrs)				NO.	MARKS	DURATION (Hrs.)
301	STRENGTH OF MATERTALS	DCE-301	03	10	10	10	01	70	3 hrs	04	02	20	1	30	3hrs	2	02	150		
302	SURVEYING-I	DCE-302	03	10	10	10	01	70	3 hrs	04	02	20	1	30	3hrs	2	06	150		
303	BUILDING CONSTRUCTION	DCE-303	04	10	10	10	01	70	3 hrs	04	02	20	1	30	3hrs	2	06	150		
304	BUILDING MATERIAL	DCE-304	04	10	10	10	01	70	3 hrs	04	02	20	1	30	3hrs	2	06	150		
305	HYDRAULIC&HYDRAULIC MACHINE	DCE-305	02	10	10	10	01	70	3 hrs	04	02	20	1	30	3hrs	2	06	150		
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	TOTAL		16	50	50	50	05	350		20	10	100	05	150		10	26	750		



# Swami Vivekanand University Sagar (M.P.)

## Scheme of Examination

PROGRAMME NAME : Three Years Diploma in CIVIL ENGG  
 Name of Scheme : CGPA 2012-13  
 Scheme of Studies and Examinations for : FOURTH SEMESTER

Implemented from Session JULY 2012-13  
 Exam Code:

COURSE CODE		PAPER CODE	THEORY COMPONENT								PRACTICAL COMPONENT					TOTAL CREDIT	GRAND TOTAL OF MARKS			
			LECTURES	CONTINUOUS EVALUATION		END OF THE TERM/ SEMESTER EVALUATION			THEORY CREDIT	PRACTICAL Hrs. Per Week	CONTINUOUS EVALUATION	END OF THE TERM/ SEMESTER EVALUATION			PRACTICAL CREDIT					
				Hrs. Per Week	TERM WORK QUIZ, ASSIGNMENT	MID TERM TEST (TWO)		THEORY PAPER				LAB. WORK QUIZ, ASSIGNMENT	PRACTICAL / ORAL EXAMINATION (VIVA)							
						I	II	NO.					MARKS	DURATION (Hrs)				NO.	MARKS	DURATION (Hrs.)
401	SOIL MECHNICS & FOUNDATION ENGG.	DCE-401	03	10	10	10	01	70	3 hrs	04	06	20	1	30	3hrs	2	06	150		
402	PUBLIC HEALTH	DCE-402	03	10	10	10	01	70	3 hrs	04	02	20	1	30	3hrs	2	06	150		
403	TRANSPORTATION ENGINEERING	DCE-403	04	10	10	10	01	70	3 hrs	04	02	20	1	30	3hrs	2	06	150		
404	BUILDING DRAWING & DESIGN	DCE-404	04	10	10	10	01	70	3 hrs	04	02	20	1	30	3hrs	2	06	150		
405	ADVANCED SURVEYING	DCE-405	02	10	10	10	01	70	3 hrs	04	06	20	1	30	3hrs	2	06	150		
TOTAL			16	50	50	50	05	350		20	20	100	05	150		10	30	750		

# STRENGTH OF MATERIALS

## Third Semester

**Course Code: DCE-301**

### **Unit I**

#### **Bending Moment and Shear Force:**

Concept of a beam, and supports (Hinged, Roller and Fixed). Types of Beams: Simply supported, cantilever, fixed, overhang and continuous beams. Types of loads (distributed and point). Concept of Bending Moment & Shear Force. Sign conventions. Bending moment and shear force diagrams for cantilever, simply supported and overhanging beams subjected to uniformly distributed and concentrated loads. Relationship between load, shear force and bending moment. Point of maximum B.M. and contra flexure.

**(10 Lectures)**

### **Unit II**

#### **Bending and Shear Stresses:**

Assumptions of theory of simple bending. Derivation of the equation.  $M/I = F/Y = E/R$ . Concept of centroid and second moment of area, Radius of gyration, Theorems of parallel and perpendicular axes, Second Moment of area for sections: rectangle, triangle, circle, trapezium, angle, Tee, I, Channel and compound sections. Moment of resistance, section modulus and permissible bending stresses, Bending stresses in circular rectangular, I,T and L section. Comparison of strength of the above sections. Concept of shear stresses in beams, Shear stress distribution in rectangular, I and T section.

**(10 Lectures)**

### **Unit III**

#### **Combined Direct & Bending Stresses and strain Energy**

Concentric and eccentric loads, eccentricity, effect of eccentric load on the section, middle third rule; stresses due to eccentric loads. Examples in the case of short columns, chimneys and dams. Meaning of strain energy and resilience. Derivation of formula for resilience of a uniform bar in tension.

**(10 Lectures)**

### **Unit IV**

#### **Slopes and Deflections of Beams:**

Definition of slope and deflection, sign convention. Circular bending. Calculation of maximum slope and deflection for the following standard cases by moment area method.

(1) Cantilever having point load at the free end., Cantilever having point load at any point of the span., Cantilever with uniformly distributed load over the entire span., Cantilever having U.D.L. over part of the span from free end Cantilever having U.D.L. over a part of span from fixed end

(2) Simply supported beam with point load at centre of the span. Simply supported beam with U.D. load over entire span.

NOTE: All examples will be for constant moment of inertia without derivation of formula.

(8 Lectures)

### Unit V

#### Columns & Struts:

Definition of long column, short column and strut, slenderness ratio, equivalent length, critical load, collapse Load, End conditions of column. Application of Euler's and Rankine's formula (no derivation), simple numerical problems based on Euler's and Rankine's formulae.

#### Torsion

Definition of torque and angle of twist. Derivation of torsion equation. Polar moment of inertia. Strength of hollow and solid shaft, advantage of a hollow shaft over a solid shaft. Comparison of weights of solid and hollow shafts for same strength. Horse Power transmitted. Calculation of shaft diameter for a given Horse Power.

(10 Lectures)

#### Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 - 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

#### Text Books:-

1. Rajput R. K., *Strength of Materials*, S.Chand & Co. Ltd., Delhi.
2. Kapoor J.K., *Strength of Materials*, Asian Publication, Muzaffarnagar.
3. Punmia B.C., *Strength of Materials*, Laxmi Publication, Delhi.

#### Reference Books:-

1. Ramamarutham S., *Strength of Materials*, Dhanpat Rai & Sons, Delhi.

# **SURVEYING -1**

## **Third Semester**

**Course Code:DCE-302**

### **Unit I**

#### **Introduction**

Concept of surveying, purpose of surveying, Measurements: linear and angular, units of measurement, instruments used for taking these measurements. Classification of survey based on instruments. Basic principles of surveying. Chain Surveying

Purpose of chain surveying, Principles of chain surveying, Equipment used in chain surveying Viz. Chains, tapes, ranging rods, arrows, pegs, cross staffs, Indian optical square their construction and uses.

Different operations in chain surveying: Ranging (direct/indirect), Offset (perpendicular/oblique) Chaining (flat and sloping ground) Conducting chain survey over an area. Recording the field data, plotting the chain survey, conventional sign. Obstacles in chain surveying.

(b) Errors in chain surveying.

(c) Correction for erroneous length of chain, simple problems. Testing and adjustment chain.

**(12 Lectures)**

### **Unit II**

#### **Compass Surveying- I**

Purpose of compass surveying. Construction and working of prismatic compass. Use of prismatic Compass, Method of setting and taking observations. Concept of following:

(a) Meridian - Magnetic, true and arbitrary.

(b) Bearing - Magnetic, True and Arbitrary.

(c) Whole circle Bearing and Reduced Bearing.

(d) Fore and Back bearing.

**(8 Lectures)**

### **Unit III**

#### **Compass Surveying- II**

Local attraction - causes, detection, errors and correction. Problems on local attraction, magnetic declination and calculation of included angles in a compass traverse. Concept of a traverse - Open and closed traverse. Traversing with a prismatic compass. Checks for an open and closed traverse. Plotting of a traverse - by included and deflection angles. Concept of closing error. Adjustment of traverse graphically. Errors in compass surveying. Testing and adjustment of a prismatic compass. Use of surveyor's compass and its construction details, comparison with prismatic compass.

**(10 Lectures)**

### **Unit IV**

#### **Leveling- I**

Purpose of leveling, concept of a level surface, horizontal surface, vertical surface, datum, reduced level and bench marks, principle and construction of dumpy and I.O.P. (Tilting) levels. Concepts of line of collimation, axis of the bubble tube, axis of the telescope and vertical axis. Leveling staff. (i) single piece (ii) Folding (iii) sop with pattern.(iv) Invar precision staff. Temporary adjustment: setting up and leveling, adjusting for parallax of Dumpy and I.O.P. level.

(8 Lectures)

## Unit V

### Leveling- II

Differential leveling concept of back sight, fore sight, intermediate sight, station, change point, height of instrument. Level book and reduction of levels by (a) Height of collimation method and (b) Rise and fall method. Arithmetic checks. Problem on reduction of levels. Fly leveling, check. Leveling and profile leveling (L-section and X-section) Errors in leveling, and precautions to minimize them and permissible limits. Reciprocal leveling. Difficulties in leveling Concept of curvature and refraction, testing and adjustment of dumpy and I.O.P. level. Numerical problems.

(10 Lectures)

### Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 - 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

### Text Books:-

1. Arora K.R., *Surveying Vol. I & II*, Standard Book House, Delhi.
2. Kanetkar T.P., *Surveying & Levelling Vol. I & II*, Pune Vidyarthi Griha Prakashan, Pune.
3. Basak P.N., *Surveying & Leveling*, Tata Mc Graw - Hill Publishing Co. Ltd., Delhi.
4. Agarwal G.D., *Surveying Vol. I & II*, Unitech Publishers, Lucknow.
5. Dass G., *Surveying Vol. I & II*, Nav Bharat Prakashan, Meerut.

### Reference Books:-

1. Punmia B.C., *Surveying Vol. I & II*, Laxmi Publications (P) Ltd. New Delhi.
2. Guggal S.K., *Surveying Vol. I & II*, New Age International Publishers New Delhi.

*Chandra A.M., Surveying Problem Solving with Theory & Objective Type Questions, New Age International Publishers New Delhi.*

# BUILDING CONSTRUCTION - I

## Third Semester

**Course Code:**DCE-303

### Unit I

**Introduction:** Definition of a building, classification of building based on occupancy. Different parts of a building. Orientation of buildings. Site selection. Exposure to building bylaws/master plan and building approval.

**Walls** Purpose of walls: Classification of walls - Load Bearing and Non Load Bearing, Dwarf wall. Classification of walls as per materials of construction, brick, stone, reinforced brick, reinforced concrete, precast hollow and solid concrete block and composite masonry walls. (a) Brick masonry - Definition of terms; mortar, bond, facing, backing, hearting, column, pillar, jambs, reveals, soffit, plinth, plinth masonry, Brick: header, stretcher, bed of brick, bat, queen closer, king closer, frog and quoin. **(10 Lectures)**

### Unit II

(b) Bond - Meaning and necessity: Types of bond and their suitability (English, Flemish, Header and Stretcher) 1, 1-1/2 and 2 Brick thick walls in English Bond. T and right angled corner junctions. Sketches for 1, 1-1/2 and 2 brick square pillars in English Bond.

(c) Construction of Brick walls - Method of laying bricks in walls, precautions observed in the Construction of walls, Method of bonding new brick work with old (Toothing, raking back and block bonding).

(d) Construction and Expansion Joints.

**(10 Lectures)**

### Unit III

#### Stone Masonry

(a) **Glossary of terms** - Natural bed of a surface, bedding planes, string course, corbel, cornice, block - in course, grouting, moldings, templates, throttling, through stones, parapet and coping.

(b) **Types of Stone Masonry:** Rubble Masonry; random and coursed, Ashlar Masonry Ashlar fine, Ashlar rough tooled Ashlar facing, specifications for coursed rubble masonry, principles to be observed in construction of stone masonry walls. Partition walls: Constructional details, suitability and uses of brick and wooden partition walls. **(10 Lectures)**

### Unit IV

Mortars - preparation, use and average strength of cement, lime, lime cement, lime surkhi and mud mortar. Scaffolding: Constructional details and suitability of mason's Brick Layers and Tubular scaffolding. Shoring & under pinning: Types and uses. Safety in construction of low rise and high rise buildings.

**Arches and Lintels:** Meaning and use of Arches and Lintels. Glossary of terms used in Arches and Lintels - Abutment, Pier, Arch ring, Intrados, Soffit Extrados, Voussoiers, Springer, Springing line, Crown, Key stone, Skew back, Span, Rise, Depth of an Arch, Haunch, Spandrel, Jambs, Bearing thickness of lintel, effective span.

**Arches:** Brick arches and their construction.

**(10 Lectures)**

### Unit V

**Doors and Windows:** Glossary of terms, used in Doors and windows.



Doors - Name; uses and sketches of Metal doors; Ledged and Battened Doors; Framed and Paneled doors, glazed and paneled doors, flush doors, collapsible doors, Rolling steel shutters side

sliding doors, Door frames, PVC shutters & metal doors. Windows - Name, uses and sketches of metal windows, fully paneled windows, fully glazed windows, casement windows, fanlight windows and ventilators, sky light window frames, Louvered shutters (emphasis shall be given for using metals, plastics etc. in place of timber).

### **Project work**

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 - 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

### **Text Books:-**

1. Kumar Susheel, *Building Construction*, Standard Publishers Distributors, Delhi.
2. Singh Gurcharn, *Building Construction*, Standard Publishers, Delhi.
3. Gupta D.V., *Building Construction*, Asian Publishers, Muzaffarnagar.

### **Reference Books:-**

1. Punmia B.C., *Building Construction*.

## **BUILDING MATERIAL**

### **Third Semester**

**Course Code: DCE-304**

#### **Unit I**

**Building Stone:** Classification of Rocks: - Geological and physical classification, Testing of stones for specific gravity, Water absorption, Durability, Weathering.

**Quarrying:-** Basic Principles involved, Methods of quarrying, Blasting, where used Principles of ballasting, Line of least resistance, Drilling of quarrying, Blasting, where used, Principles of ballasting, Line of least resistance, Drilling of holes (Manually and mechanically), charging, tamping, Fugues and detonators, safety precaution, common explosives - only Name and their use.

**Wedging:-** Where used, Tools required and operation of wedging, stone Crushing; Process and Equipment used, crushers, grinding mills.

**Availability, Characteristics and uses of the following stone:-**

Granite, Sand stone, Lime stone, Slate, basalt, trap quartzite and marble, Availability of different stones in the state. **(8 Lectures)**

#### **Unit II**

**Bricks & clay Products:-** Raw material for manufacture, Properties of good brick making earth, field-testing of brick clay. Manufacture of bricks, Preparation of clay-Manually/Mechanically.

**Molding:** hand molding and machine molding, drying of bricks, Burning of bricks, Types of Kilns, Bull's Trench Kiln and Hoffman's kiln, Process of burning, Size of standard Bricks, its classification of brick as per I.S. and testing of common building bricks as compressive strength, water absorption, efflorescence test. **(8 Lectures)**

### Unit III

**Lime and Cement:- Lime:-** Natural sources of lime, Definition of Quick, fat, hydraulic, hydrated lime, calcinations, slaking, manufacture of lime, process of setting and hardening action of lime field test of lime, pozzolonic material types, properties and uses.

**Cement:** Natural and artificial cement, Raw materials, manufacture of ordinary Portland cement, Flow diagram for dry and wet process, setting and hardening of cement. Types of cement, Properties of cement, Test of cement as per Indian standard. **(8 Lectures)**

### Unit IV

**Timber, Paints and Insulating Materials Timber:-** Classification of Trees,- Cross Section of an Exogenous tree and explanation of terms, identification of different types of timber, teak, Chir, Shisham, Sal, Mango, deodar, kail etc., Seasoning of Timber - Purpose, Types of seasoning, water, Air, Kiln, Chemical & solar Kiln seasoning.

**Defects in Timber:-** Decay in Timber, Preservation of timber, Method of treatment, Properties of good timber, common structural timber in India, Plywood, Veneers, Manufacture of plywood & its uses, Laminated Boards, Block Boards, Fiber Boards, Plastic Coated finishes, Water & fire resistant Plywood, PVC Boards.

**Paints:-** Various Types of Paints their function and properties, cement paints their properties and uses, Varnish & polish, Lacquers' and enamels their properties uses and trade names.

**Insulating Material:-** Properties, uses and requirement of heat and sound insulating materials, properties and uses of cork, Rockwool, Glass wool, Concrete, Aluminum foil, Asbestos sheets for ceiling & their commercial name. **(8 Lectures)**

### Unit -V

**Glass, Plastic and water Proofing Materials Glass:-** Types of glasses and their properties: Sheet, plate frosted, wired fiber and bullet resisting glass colored glass and commercial size, forms & their use.

**Plastic:-** Properties and uses of plastic, Imported commercial product, use of plastic in civil engineering, Plastic Pipes, Taps, Valves, Plastic coated paper, Polythene sheets, Bakelite, thermocol, P.V.C. Rexene and Linoleum. Water Proofing Materials Properties and commercial trade name. **(8 Lectures)**

### Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 - 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

### Text Books:-

1. Gurcharan Singh, *Building Materials*, Standard Publishers Distributors, Delhi.
2. Rangwala S.C., *Engineering Materials*, Charotar Publishing House Pvt. Ltd., Adand.
3. Mittal D.C., *Engineering Materials*.

### Reference Books:-

1. Kulkarni G.J., *Engineering Materials*.

# HYDRAULICS & HYDRAULIC MACHINES

## Third Semester

CourseCode:DCE-305

### Unit I

Properties of Fluids: **Fluids** : Real fluid, ideal fluid., Fluid Mechanics, Hydraulics, Hydrostatics, Hydro kinematics., Mass density, specific weight, specific gravity, cohesion, adhesion, viscosity, surface tension, capillarity, vapor pressure and compressibility. Hydrostatic Pressure: Pressure, intensity of pressure, pressure head, Pascal's law and its applications. Total pressure, resultant pressure, and centre of pressure. Total pressure and centre of pressure on vertical and inclined plane surfaces: Rectangular, Triangular, Circular. **(10 Lectures)**

### Unit II

**Measurement of Pressure:** Atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure. Use of simple manometer, differential manometer and mechanical gauges. Measurement of pressure by manometers and pressure gauges. Fundamental of Fluid Flow, Types of Flow, Steady and unsteady flow, Laminar and turbulent flow Uniform and non-uniform flow. Discharge and continuity equation (flow equation) Types of hydraulic energy. Potential energy, Kinetic energy, Pressure energy Bernoulli's theorem; statement and description (without proof of theorems). Venturimeter (horizontal and inclined) **(10 Lectures)**

### Unit III

**Orifice:** Definition of Orifice, and types of Orifices, Hydraulic Coefficients. Large vertical orifices. Free, drowned and partially drowned orifice. Time of emptying a rectangular/circular tanks with flat bottom.

**Flow through Pipes:** Definition, laminar and turbulent flow explained through Reynold's Experiment. Reynolds Number, critical velocity and velocity distribution. Head Losses in pipe lines due to friction, sudden expansion and sudden contraction entrance, exit, obstruction and change of direction (No derivation of formula). Hydraulic gradient line and total energy line. **(10 Lectures)**

### Unit IV

#### **Flow through open channels:**

Definition of a channel, uniform flow and open channel flow. Discharge through channels using. **(i)** Chezy's formula (no derivation) **(ii)** Manning's formula **Most economical sections: (i)** Rectangular **(ii)** Trapezoidal

**Flow Measurements:** Measurement of velocity by Pitot tube , Measurement of Discharge by a Notch, Difference between notches and orifices. Discharge formulae for rectangular notch, triangular Notch, trapezoidal notch, and conditions for their use. (with derivation) Measurement of discharge by weirs. Difference between notch, weir and barrage. Discharge

formula for free, drowned, and broad crested weir with and without end contractions; velocity of approach and condition of their use. (10 Lectures)

#### Unit V

**HYDRAULIC MACHINE:** Reciprocating pumps, Centrifugal pumps, Impulse Turbines, Reaction Turbines, Sketching and description of principles of working of above mentioned machines. (8 Lectures)

#### Project work

A project work will be assigned to the students by marks and will be evaluated by the faculty itself. The students will work in a group of 3 - i the subject taught by the faculty and should have practical skill & knowledge.

#### Text Books:-

1. *Fluid Mechanics & Hydraulic Machines*
2. Vijay Gupta & Gupta S.K., *Fluid Mech* Delhi.
3. Kapoor J.K., *Hydraulics*, Bharat Bharti
4. Likhi S.K., *Hydraulics Laboratory Ma* Delhi.

#### Reference Books:-

- Garde R.J., *Fluid Mechanics*, New Age International Publishers, New Delhi.  
Jagdish Lal, *Hydraulics & Hydraulic Machines*, Metropolitan Book Depot, Delhi.

## STRENGTH OF MATERIALS LAB Third Semester

#### Course Code: DCE -301

1. Determination of shear force at different sections on a simply supported beam under points loads.
2. Determination of bending moment at different sections on a simply supported beam under different types of loading.
3. Determination of yield stress, ultimate stress, percentage elongation, plot the stress strain diagram and compute. the value of Young's Modulus of mild steel.
4. Determination of the maximum deflection and Young's Modulus. of elasticity by deflection apparatus.
5. Determination of modulus of rigidity of material by Torsion apparatus.

6. Determination of hardness of a metal plate by Rock Well Brinell hardness testing machine.
7. To perform impact test on Izod Impact testing machine.

**Evaluation of Practical Examination: Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation scheme:**

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

**External Evaluation (50 marks)**

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

**SURVEYING LAB - I**  
**Third Semester**

**Course Code: DCE 302**

**Chain surveying**

**Ex. (i)** (a) Ranging a line.

- (c) Chaining a line and recording in the field book.
- (d) Testing and adjustment of chain.

**Ex. (ii)** (a) Chaining of a line involving reciprocal ranging

- (b) Taking offsets and setting out right angles with cross staff and Indian optical square.

**Ex. (iii)** Chain survey of a small area. **Plate -I**

**Ex. (iv)** Chaining a line involving obstacles in ranging. **Compass survey**

**Ex. (v)** (a) Setting the compass and taking observations .

- (b) Measuring angle between the lines meeting at a point by prismatic compass.

**Ex. (vi)** Traversing with the prismatic compass and chain of a closed traverse. (Recording and plotting by included angles).

**Plate -II**

**Ex. (vii)** Traversing with the prismatic compass and chain of a closed and open traverse. (Recording and plotting by deflection angles).

**Plate III**

**Ex. (viii)** Determination of local traction at a station by taking fore and back bearing.

**Ex. (ix)** To find true bearing of a line at a place.

**Leveling:**

**Ex. (x)** To find difference of level between two distant points by taking staff reading on different stations from the single setting.

**Ex. (xi)** To find difference of level between two points by taking at least four change points .

**Ex. (xii)** Longitudinal sectioning of a road. **Plate IV**

**Ex. (xiii)** Cross- sectioning of a road. **Plate V**

**Ex. (xiv)** Setting a gradient by I.O.P. level.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation scheme:**

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

**External Evaluation (50 marks)**

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

## BUILDING CONSTRUCTION LAB

### Third Semester

**Course Code: DCE -303**

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**LIST OF PRACTICALS:**

1. To conduct field tests of cement.
2. To determine normal consistency of cement.
3. To determine setting time (initial and final) of cement.
4. To determine fineness of given sample of cement.
5. To determine compressive strength of bricks.
6. To determine water absorption of bricks
7. determine soundness of cement.
8. To Layout of a building.

9. To construct brick bonds (English and Flemish bonds) in one, one and half and two brick thick (a) walls. L, T and cross junction. (b) Column.
10. Visit to construction site for showing the following item of works and to write specific report about the works seen.
  - (a) Timbering of excavated Trenching.
  - (b) Construction of Masonry Walls.
  - (c) Flooring: Laying of flooring on an already prepared lime concrete base.
  - (d) Plastering and Pointing of wall.
  - (e) White & colour washing.
  - (f) Use of Special type of shuttering/cranes/heavy machines in construction work.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 10 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation scheme:**

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

**External Evaluation (50 marks)**

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

## BUILDING MATERIAL LAB

### Third Semester

**Course Code: DCE-304**

#### MATERIAL TESTING

1. Test for bricks.
2. Test for stones.
3. Test for cement
4. Test for bitumen.

(ii) **Evaluation of Practical Examination: Internal Evaluation (50 marks)**

(iii) Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

(iv) **Evaluation scheme:**

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

(v)

(vi) **External Evaluation (50 marks)**

(vii) The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

## HYDRAULICS & HYDRAULIC MACHINES LAB

### Third Semester

**Course Code: DCE -305**

- (i) To verify Bernoulli's Theorem.
- (ii) To find out venturimeter coefficient.
- (iii) To determine coef. of velocity ( $C_v$ ), Coef. of discharge ( $C_d$ ) Coef. of contraction ( $C_c$ ) and verify the relation between them.
- (iv) To perform Reynold's Experiment.
- (v) To determine Darcy's coefficient of friction for flow through pipes.
- (vi) To verify loss of head due to:
  - (a) Sudden enlargement
  - (b) Sudden Contraction.
- (vii) Study of the following
  - (viii) Reciprocating Pumps or Centrifugal Pumps.
  - (ix) Impulse turbine or Reaction turbine
  - (x) Pressure Gauge /pitot tube.

**Evaluation of Practical Examination: Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:



PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

**External Evaluation (50 marks)**

**The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.**

# SOIL MECHANICS AND FOUNDATION ENGINEERING

## Fourth Semester

**Course Code: DCE 401**

### **Course Contents:**

#### **Unit I**

**Introduction:-** Definition of soil Mechanics and foundation engineering. Soil formation -different kinds of soils and soil structures.

**Fundamental definitions & their relationships:-** Graphical representation of soil as a three phase system. Definitions of moisture content, unit weight of soil mass such as bulk density, saturated density, submerged density and dry density, specific gravity, mass specific gravity, void ratio, porosity and degree of saturation, percentage air voids and their content, density index. Relationships between various terms stated above. Consistency limits Liquid limit, Plastic limit, Shrinkage limit, Plasticity index, Consistency index. Grain size analysis - Sieve and Hydrometer analysis, C.C. and C.U. **(9 Lectures)**

#### **Unit II**

**Classification of soils:-** Particle size classification - M.I.T., and I.S., U.S. bureau of soils and U.S., P.R.A. Textural classification chart, brief description of plasticity chart. I.S. soil classification.

**Permeability of soils:-** Definition of permeability. Interpretation of Darcy's law, definition of discharge, velocity and seepage velocity and coefficient of percolation. Factors affecting permeability. Laboratory methods of falling head and constant head, field methods of pumping- out tests and pumping-in tests. **(9 Lectures)**

#### **Unit III**

**Compaction:-** Definition of Compaction. Standard & modified Procter compaction test. Different methods of compaction. Factors affecting compaction. Brief description of field compaction methods. Compacting equipments and field control. Indian Standards.

**Consolidation:-** Definition of consolidation and its effect on foundation settlement. Difference between consolidation and compaction. **(12 Lectures)**

#### **Unit IV**

**Shear strength:-** Definition of shear strength. Definition of Cohesive (c) & non cohesive (Phy.) soil. Coulomb's equation. Shear box and unconfined compression tests.

**Earth pressure and earth retaining structures :-** Definition of earth pressure, active and passive earth pressures, terms and symbols relating to a retaining wall. Relation between movement of wall and earth pressure.  $K_a$  and  $K_b$  by Rankin's Method. Simple earth pressure calculations without surcharge. **(12 Lectures)**

## Unit V

**Shallow and deep Foundation:-** Definitions of shallow and deep foundations. Types of shallow and deep foundations. Application of Terzaghi's bearing capacity formulae for different types of foundations. Factors affecting depth of shallow foundation. Classification of piles. Plate bearing tests for shallow foundations. **(9 Lectures)**

### Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 - 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

### Text Books:-

1. Sehgal S.B., *Soil Mechanics*, C.B.S. Publishers & Distributors Pvt. Ltd., New Delhi.
2. Dr. Alam Singh, *Basic Soil Mechanics & Foundations*, C.B.S. Publishers & Distributors, New Delhi.
3. Minocha & Diwedi, *Soil Mechanics*, B. Bharat Prakashan, Meerut.
4. Gadi S.K., *Soil Mechanics*, B.Tech Publishers, Lucknow.
5. Sharma S.K., *Soil Mechanics*, Aisan Publishers, Muzaffarnagar.

### Reference Books:-

1. Punmia B.C., *Soil Mechanics & Foundation Engineering*, Laxmi Publication Pvt. Ltd., New Delhi.
2. Lambi, *Soil Mechanics*.

## PUBLIC HEALTH ENGINEERING - I Fourth Semester

### Course Contents: DCE-402

#### Unit I

##### (A) Water Supply Engineering

**Introduction:-** Necessity and brief description of water supply system. Water requirement: Per capita consumption for domestic, industrial, public and firefighting uses as per IS standards. Consumption, demand and its variation.

**Sources of Water:-** Surface water sources : Rivers, canal, impending reservoir and lakes, their quality of water and suitability. **(10 Lectures)**

#### Unit II

**Water Treatment:-** Suspended, colloidal and dissolved impurities. Physical, chemical and bacteriological tests and their significance. Minimum standards required for drinking water, Principles of Sedimentation, Coagulation, Flocculation, Filtration, Disinfection (Chlorination) including Jar Test, Break point chlorination, Residual chlorine. Flow diagram of different treatment units. Function, constructional details, working and operation of

(i) Aeration fountain (ii) Mixer (iii) Flocculate (iv) Clarifier (v) Slow and rapid sand filter (vi) Chlorination chamber (viii) Water softening (ix) Removal of Iron and Magnesia. Chemicals required for water treatment, their uses, and feeding devices. Simple design of sedimentation tank, and filters. **(10 Lectures)**

#### Unit III

### **Water Distribution**

- (i) **Pipes:-** Different types of Pipes:- Cast iron, steel, plastic, (PVC,LDPE,HDPE), asbestos cement, concrete, plastic, GI and lead pipes. Details of their sizes, joints and uses.
- (ii) **Appurtenances:-** Sluice (Gate and spindle), air, reflux, scour and safety valves, fire hydrants, their working and uses.
- (iii) **Storage:** Necessity, types of storing tanks: G.I. Sheet Tank, P.V.C. tank, over head tanks. **(10 Lectures)**

### **Unit IV**

**Laying of Pipes:** Setting out alignment of pipe line. Excavation in different types of soils and precautions taken. Precautions taken for traffic control, bedding for pipe line. handling, lowering, laying and jointing of pipes, testing of pipe lines and back filling. Use of boning rods. **(10 Lectures)**

### **Unit V**

**Building Water Supply (i)** General layout of water supply arrangement for a building (single and multistoried) as per IS Code of practice. Water supply fixtures and their installation. Tapping of water mains. **(ii)** Hot and Cold Water supply in buildings. Use of Solar water heaters. **(iii)** Rural water supply: Sources, treatment and distribution.

**Maintenance:-** Leakage detection and prevention. Replacement of damaged pipe. Maintenance of domestic plumbing fixtures. **(10 Lectures)**

### **Project work**

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 - 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

### **Text Books:-**

1. Rangwala S.C, *Water Supply & Sanitary Engineering*, Charotar Publishing House (P) Ltd., Anand.
2. Gurcharan Singh, *Water Supply & Sanitary Engineering*, Standard Publishers Distributors, Delhi.
3. Garg S.K., *Water Supply Engineering*, Khanna Publishers, Delhi.
4. Gupta D.V., *Water Supply & Sanitary Engineering*, Asian Publishers, Muzaffarnagar.

### **Reference Books:-**

1. Modi P.N., *Water Supply Engineering*, Standard Book House, Delhi.

## **TRANSPORTATION ENGG.-I** **Fourth Semester**

### **Course Contents: DCE-403**

#### **UNIT-I**

**1.OVERVIEW OF TRANSPORTATION ENGINEERING :** Role of transportation in the development of nation. Modes of transportation system – roads, railway, airways, waterways, Importance of each mode, comparison and their relative merits and demerits. Necessity & importance of Cross drainage works for roads & railways.

## UNIT-II

**2.RAILWAY ENGINEERING :** Alignment and Gauges, Classification of Indian Railways, zones of Indian Railway. Alignment- Factors governing rail alignment. Rail Gauges – types, factors affecting selection of gauge. Rail track cross sections – standard cross section of BG & M.G Single & double line in cutting and embankment. Permanent ways.

## UNIT-III

**3.IDEAL REQUIREMENT, COMPONENT PARTS :** *Rails* – function & its types. *Rail Joints* – requirements, types, *Creep of rail* - causes & prevention of creep. *Sleepers* – functions & Requirement, types – wooden, metal, concrete sleepers & their suitability, sleeper density. *Ballast* – function & different types with their properties, relative merits & demerits. *Rail fixtures & fastenings* – fish plate, bearing plates, spikes, bolts, keys, anchors & anti creepers. Railway Track Geometrics. Coning of wheels, tilting of rails, Gradient & its types, Super elevation, limits of Super elevation on curves, Cant deficiency, negative cant, grade compensation on curves. 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-crossovers, scissor cross over, diamond crossing, 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. *Track Maintenance* - Necessity, types, Tools required and their function, organization, duties of permanent way inspector, gang mate, key man

## UNIT-IV

**4.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 Piers-function, requirements, types. *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, pre-stressed 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.

## UNIT-V

**5.TUNNEL ENGINEERING :** Definition, necessity, advantages, disadvantages. Classification of tunnels. Shape and Size of tunnels. Tunnel Cross sections for highway and railways. *Tunnel investigations and surveying* –Tunnel surveying locating center line on ground, transferring center line inside the tunnel. *Shaft* - its purpose & construction. *Methods of tunneling in Soft rock* - needle beam method, fore-poling method. line plate method, shield method. *Methods of tunnelling in Hard rock* – Full face heading method, Heading and bench method, drift method. Precautions in construction of tunnels. *Drilling equipments*-drills and drills carrying equipments. Types of explosives used in tunnelling. Tunnel lining and ventilation.

## BUILDING DRAWING& DESIGN Fourth Semester

**Course Contents: DCE-404**

### UNIT-I

**1.CONVENTIONS :** Conventions as per IS:962-1967 and other practices Types of Lines – Visible line, Centerline, Hidden line, Section line, Dimension line, Extension line, Pointers, Arrow heads or dots. Dimensioning systems. Symbols – Materials used in construction, building components. Reading of available ammonia prints of residential buildings.

### UNIT-II

**2.PLANNING OF BUILDING :** Principles of planning of Residential and Public building. Space requirements and norms for various units of Residential and Public building. Rules and byelaws of local governing authorities for construction. Drawing of line plans for Residential and Public building

### UNIT-III

**3.BUILDING DRAWING :** Development of plan from line plan of a residential building, Elevation, Section, Site plan, Location Plan, Foundation plan, Area statement and other details. Submission Drawing and Working Drawing.

### UNIT-IV

**4.DETAILED DRAWING :** Drawing of staircase, drawing of steel truss & lean to roof, drawing of layout plan of water supply line with accessories. Layout plan of sanitary line - position of inspection chamber, septic tank, sanitary fittings. Position of wash basin, sink etc.

## UNIT-V

5.PERSPECTIVE DRAWING : Definition, Necessity, Principles of Perspective Drawing, Terms used in perspective drawing, Two point perspective view of a small object like pedestal, step block, small single storied building with flat roof etc.

### Text Books:-

1.BUILDING DRAWING& DESIGN BY MU & MALLICK

## ADVANCED SURVEYING SEMESTER: FOURTH

COURSE CODE:DCE-405

### UNIT-I

PLANE TABLE SURVEY : Principles of plane table survey. Accessories required. Setting out of plane table , Leveling ,Centering and orientation. Methods of plane table surveying – Radiation, Intersection, and Traversing. Merits and Demerits of plane table Surveying. situations where plane table survey is used. Use of Telescopic Alidade.

### UNIT-II

THEODOLITE SURVEY: Components of Transit Theodolite and Their functions. Technical terms used. Temporary adjustments of Transit Theodolite. Swinging the telescope, Transiting, Changing the face. Measurement of Horizontal angle, method of Repetition, errors eliminated by method of repetition. Measurement of Deflection angle. Measurement of Vertical angle. Measurement of magnetic bearing of a line by Theodolite. Prolonging a Straight line. Sources of errors in Theodolite Surveying. Permanent adjustment of transit Theodolite ( only relationship of different axes of Theodolite.) Traversing with Theodolite – Method of included angles, locating details, checks in closed traverse,Calculation of bearings from angles. Traverse Computation - Latitude, Departure Consecutive Co-ordinates error of Closure, Distribution of a angular error, balancing the traverse by Bowditch rule and Transit Rule, Gale's traverse table. simple problems on above topic.

### UNIT-III

TACHEOMETRIC SURVEY: Principle of Tacheometry. Essential requirements of Tacheometer. Use of Theodolite as a Tacheometer with staff held in vertical and fixed hair method (No derivation). Determination of tacheometric constants, simple numerical problems on above topics

## UNIT-IV

, CURVES: Types of curves used in road and railway alignments. Notations of simple circular curve. Designation of curve by radius and degree of curves. Method of Setting out curve by offset from Long chord method and Rankine's method of deflection. angles. Simple Numerical problems on above topics.

ADVANCED SURVEY EQUIPMENTS: Construction and use of one second Micro Optic Theodolite, Electronic Digital Theodolite. Features of Electronic Theodolite Principle of E.D.M, Components of E.D.M and their functions, use of E.D.M. Total station

## UNIT-V

AERIAL SURVEY AND REMOTE SENSING: Aerial Survey Introductions, definition, Aerial photograph. Remote Sensing – Introduction, Electro-Magnetic Energy , Remote sensing system- Passive system , Active system. Applications – mineral, land use / Land cover, Natural Hazards and Environmental engineering system

### Text Books:-

1. ADVANCED SURVEYING BY S.K DUGGAL.

## SOIL MECHANICS AND FOUNDATION ENGINEERING LAB

### Fourth Semester

Course Code: DCE 401

1. Determination of moisture content by oven drying method.
2. Determination of specific gravity of soil particles by specific gravity bottle/pycnometer.
3. Determination of soil particles size distribution by sieving.
4. Determination of liquid limit and plastic limit of soil.
5. Determination of permeability by constant Head Permeameter and falling head permeameter.
6. Shear strength of clean sand by Shear Box test.
7. Unconfined compression test.
8. Standard Proctor compaction test.
9. Determination of field density of soil by sand replacement and cutter methods.
10. Determination of Standard Penetration Test.

### Evaluation of Practical Examination: Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.



**Evaluation scheme:**

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

**External Evaluation (50 marks)**

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination

**PUBLIC HEALTH ENGINEERING LAB**

**FOURTH SEMESTER**

**Course Code: DCE 402**

1. To determine dissolved and suspended solids in water.
2. To determine pH value of water sample.
3. To determine turbidity of water.
4. To calculate:
  - i. Oxygen Demand (OD)
  - ii. Biological Oxygen Demand (BOD)
  - iii. Chemical Oxygen Demand (COD)
5. To determine residual chlorine in water sample.
6. To perform Jar Test for Coagulants.
7. To collect samples of water from shallow & deep wells.
8. To perform chlorine demand test.
9. To determine hardness of water.
10. To determine available chlorine in bleaching powder.
11. To perform field test for the detection of intermediate pollution in drinking water by OT test.
12. To visit and write specific report for the following: (Any three)

- a. Water treatment plant for moderate town (say Population 1 lacs) b. Sewage treatment plant for 5 lac to 10 lac population c. Sewage disposal work. d. Construction site for layout of water supply 6 sewerage system. e. Industrial effluent treatment plant

**Evaluation of Practical**

**Examination: Internal Evaluation**

**(50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation scheme:**

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

**External Evaluation (50 marks)**

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination

**TRANSPORTATION ENGG.-I LAB**  
Fourth Semester

**LIST OF EXPERIMENTS**

**Course Contents: DCE-403**

**PRACTICALS : 2 hrs per week**

**Visits & Report Generation** : Student will have to prepare at least 08 reports on visits to different maintenance and operations related to railway tracks during visits. The write-ups for the reports should include following information :

- i) Objects of maintenance operations.
- (ii) Materials required.
- (iii) Tools and Equipments needed.
- (iv) Maintenance procedure.
- (v) Precautions to be taken during maintenance operations.
- (vi) Remedial measures and quality control to reduce requirements.

**TOPICS FOR VISITS & REPORTS**

1. Through packing
2. Shovel packing Track
3. maintenance Systematic
4. overhauling Lifting of
5. track Lowering of track
6. Counteraction, measurement and adjustment of creep
7. Organization, Tools and equipments for maintenance.
8. Maintenance of points and crossings
9. Maintenance of level crossing.
10. Maintenance of proper Drainage
11. Maintenance of gauge
12. Maintenance of track components.
13. Welding of Rails.

14. Visit to a nearby bridge site where the construction is in
15. Progress Visit for cross drainage works for roadways and railways
16. Other items may be suggested by Teacher/guide

**BUILDING DRAWING & DESIGN-LAB**  
Fourth Semester  
**LIST OF EXPERIMENTS**

**Course Contents: DCE-404**

**PRACTICALS : 2 hrs per week**

1. Drawing various types of lines, lettering and symbols of materials, doors and windows etc. Used in construction on Full Imperial size drawing sheet.
2. Drawing the lines plans of following buildings on Full Imperial size **graph**
3. Residential Building (Min. three rooms)
4. Public Building – School building, Primary health center / Hospital
5. Measured Drawing of an existing residential Building (Load bearing/ Notes, Schedule of openings, Site Plan, Area statement etc.
6. Submission Drawing of two storied residential building (Framed structure type) showing Plans , Elevation, Sections, Foundation Plan ,construction notes, Schedule of openings, Site Plan ,Area statement etc.
7. Working drawing of above drawing sheet preferably one plan, section
8. Two point perspective view of a building drawn in submission drawing.
9. Tracing of a submission drawing prepared at Sr. No.4 above.
10. Ammonia print of submission drawing prepared at Sr. No.4 above.

**ADVANCED SURVEYING**  
**SEMESTER: FOURTH**  
**LIST OF EXPERIMENTS**

**Course Contents: DCE-405**

1. Using accessories carry out temporary adjustments of plane table. Locating details by method of Radiation.
2. Locating details with plane table by method of intersection.
3. Understanding the components of Theodolite and their functions, reading the vernier and temporary adjustments of theodolite.
4. Measurement of Horizontal angle by transit theodolite.
5. Measurement of Horizontal angle by method of Repetition.
6. Measurement of vertical angles by theodolite.
7. Measurement of Magnetic bearing of a line using theodolite
8. Measurement of deflection angle by taking open traverse of 4 –5 sides.
9. To find reduced levels and horizontal distances using theodolite as a Tachometer.
10. To find constants of a given Tachometer
11. Study and use of 1 second Micro Optic Theodolite for measurement of Horizontal and Vertical angles.
12. Study of E.D.M. for knowing its components.
13. Use of EDM for finding horizontal and vertical distances and reduced levels.
14. Determine the geographical parameters by total station.
15. Use of Aerial survey (GPS, goggle earth, ISRO satellite etc.