Scheme of Teaching and Examination for
V Semester DIPLOMA in CIVIL ENGINEERING

THEORY

Sl. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION - SCHEME					
			Periods per Week	Periods in one Session (Year)	Hours of Exam.	Terminal Exam. (A) Marks	Final Exam. (B) Marks	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
1.	Transportation Engineering	15501	06	60	03	20	80	100	26	36
2.	Computer Aided Design & Drafting	15502	06	60	03	20	80	100	26	36
3.	Mechanics of Structure	15503	06	60	03	20	80	100	26	36
4.	Hydrology & Irrigation Engineering	15504	06	60	03	20	80	100	26	36
5.	Quantity Surveying & Costing-II	15505	06	60	04	20	80	100	26	36
	Total :-		30					500		

PRACTICAL

Sl. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION – SCHEME					
			Periods per Week	Periods in one Session (Year)	Hours of Exam.	Marks Internal Exam. (A)	Marks External Exam. (B)	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
6.	Computer Application Lab. (CADD)	15506	04	60	04	10	40	50	16	21
7.	Civil Engineering Lab.	15507	04	60	03	20	80	100	32	42
	Total :-		8					150		

SESSIONAL

Sl. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION - SCHEME			
			Periods per Week	Periods in One Session (Year)	Marks of Internal Examiner (X)	Marks of External Examiner (Y)	Total Marks (X+Y)	Pass Marks in the Subject
8.	Quantity Surveying & Costing-II	15508	4	50	20	30	50	25
9.	In Plant Training & Visit to Work	15509	4 Weeks Continuous		20	30	50	25
	Total :-		4				100	

Total Periods per Week	42	Total Marks	750

TRANSPORTATION ENGINEERING

Subject Code **15501**	Theory			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	06	-	-	Internal Exam.	:	20

Rationale :

      Transportation is vital for industrial and agricultural development of any region. Socio-economic progress is intimately linked with an efficient system of transportation of goods and people from one region to another. Transportation is, also, essential for strategic movements in case of defence emergencies. Hence construction of roads, rails & bridges form a very important job function of a civil engineering technician.

Objective:

The students will be able to :
- Define different terms in Highway, Railway & Bridge Engineering.
- Know about highways classification
- Know about the factors covering location of highways and their alignment.
- Know Sign and Signals, Traffic island, Highway Illumination, Traffic Planning and administration, No. of traffic lanes, Camber, Gradient, super elevation.
- Understand about Highway materials, Road constructions, Road drainage, Road Environment, Road maintenance.
- Know about Rails, Sleepers, Point and Crossing, Track construction, Stations and yards, Signalling and interlooking, Track maintenance.
- Know the classification of Bridges causeways and culverts, Afflux, Scour and crossings and their differences.
- Know how to align Piers, Abutment, wing walls and Approaches, Bridge Construction & Maintenance.

S.No.	Topics	Periods
01	Highway Engineering.	(40)
02	Railway Engineering.	(10)
03	Bridge Engineering.	(10)
	Total :	**(60)**

CONTENTS:

TOPIC: 01 – HIGHWAY ENGINEERING : **[40]**

01.01	Importance & modes of Trasportation, Brief history of highway developments, highway classification, Organisations & Associations.	03
01.02	Highway Planning & Survey : Factors influencing road planning. Factors covering location of highways and their alignment. Highway survey.	03
01.03	Traffic Engineering : Traffic Survey; Traffic characteristics, traffic operations, Traffic Accidents, Traffic markings, Signs & Signals; Traffic Island; Highway illumination; Traffic planning & administration.	07
01.04	Geometic Design : Righ of way; Width of formation Width of pavement; Number of Traffic Lanes; Camber; Gradient; Super elevation & Transition; Speed; Sight distance, Methods of providing super elevation; IRC specifications.	08
01.05	Highway materials : Sub grade soil, Stone Aggregates; Bituminous materials, Bituminous paving Mixes; Cement concrete.	03
01.06	Basic description of flexible, Rigid Pavements.	03
01.07	Road Construction : Construction of Earth Roads; Construction of Water Bound Mocadam Roads; Construction of Bituminous pavements; Construction of Cement concrete pavements.	06
01.08	Road Drainage : Need for Drainage, surface & underground drainage.	03
01.09	Road Environment : Environmental factors in Highway planning; Arboriculture.	02
01.10	Road Maintenance : Road accidents, its Remedial measures.	02

TOPIC: 02 – RAILWAY ENGINEERING: [10]

02.01	Introduction.	01
02.02	Permanent Way – Gauge of tracks, rails, sleepers, ballast, fixtures & fastenings.	02
02.03	Points & Crossing.	02
02.04	Track Construction.	01
02.05	Stations & Yards.	02
02.06	Signalling & Inter Locking.	01
02.07	Track Maintenance.	01

TOPIC: 03 – BRIDGE ENGINEERING: [10]

03.01	Introduction – Classification of Bridges, temporary & permanent bridges, causeways & culverts.	01
03.02	Investigation – Site Selection; Collection of Hydraulic design data; Lineal water way; Afflux; Economical span, Scour & Erosion & their differencer.	04
03.03	Foundation – Scour Depth; depth of foundation, types of foundation, pile, well Raft, Caisson & Coffer Dam.	03
03.04	Piers, Abutment, Wing Wall & Approaches.	02

Reference Books :

1.	Highway Engineering	-	Khanna & Justo
2.	Highway Engineering	-	Sharma & Sharma
3.	I R C standard		
4.	Railway Engineering	-	N.L. Arora
5.	Railway Engineering	-	Anita
6.	Bridge Engineering	-	Rangwala
7.	Railways, Bridge & Tunnel	-	N. L. Arora
8.	Introduction to Bridge	-	N. Krishamurthy
9.	Highway Engineering	-	Kurkarni
10.	jsyos] egkekxZ ,oa iqy bZthfu;jhax	&	xq:pj.k flag
11.	jsyos] egkekxZ ,oa iqy bZthfu;jhax	&	vkgqtk ,oa fonhZ
12.	lM+d] jsyos ,oa iqy bZthfu;jhax	&	lquhy jatu
13.	Railway, Road & Bridge	-	Singhal
14.	A Course In Highway Engg.	-	Brinda
15.	Transportation Engg.	-	Vazirani
16.	Principles of Bridge Engg.	-	Brinda
17.	Road, Rail Bridge & Tunnel Engg.	-	B.L. Gupta

COMPUTER AIDED DESIGN & DRAFTING

Subject Code **15502**	Theory			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	06	-	-	Internal Exam.	:	20

Rationale and Objective:

S.No.	Topics	Periods
01	Introduction to drafting package.	(04)
02	Understanding CAD commands.	(08)
03	Basic Drawing Techniques.	(12)
04	Drawing.	(08)
05	Plan and Elevation of two room storey building.	(08)
06	Multiscale Drawing.	(08)
07	Plotting of drawing.	(04)
08	Three Dimensional Drawing.	(08)
	Total :	**(60)**

CONTENTS:

TOPIC: 01 – INTRODUCTION TO DRAFTING PACKAGE : [04]

01.01   AutoCAD- Version, Features, Methods of getting started, Opening of existing drawing, Starting of new drawing, Use of Templates, Starting Wizard, Drawing Area, Menus, Tool Bar & Starting up of drawing area.

TOPIC: 02 – UNDERSTANDING CAD COMMANDS: [08]

02.01   **Starting Command** :- toolbar icon, flyout toolbar, Pull down menus, Keyboard menus.

02.02   **Executing Commands :-** Working with command prompt, line circle, Area Erase, Zoom, Break, Object Snaps.

02.03   **Ending Commands :-** Fillet, Donut, Offsets, Fillet, Extending, Trimming, Move, Text, Dim, Hatch, Drag, Copy, Paste, Trim etc.

TOPIC: 03 – BASIC DRAWING TECHNIQUES: [12]

03.01   **Relocating Entities :-** Screen limits, Set units & Precision, UCS icon, Crosshair, Size option window.

03.02   **Dimensioning :-** Linear, Radial, Diameter and Angular Dimension.

03.03   **Layers :-** Layer specifications.

03.04   **EntityControls :-** Line type, Scale factor, Use of array and mirror commands.

03.05   **W Block/Block :-** Create Block files, Use of layers and Solid Commands.

03.06   **Attributes :-** Borders & Title Block Construction.

TOPIC: 04 – DRAWING: [08]

04.01   Other Mode, Grid Command, Ellipse Construction.

04.02   Laying out the walls, Exterior Wall Lines, Interior Wall, Cutting Opening in the walls, Creating Doors etc.

TOPIC: 05 – PLAN AND ELEVATION OF TWO ROOM STOREY BUILDING. [08]

TOPIC: 06 – MULTISCALE DRAWING: [08]

06.01   Sealing Drawing, Proto Drawing, Floor Drawing, Wall Detail Drawing.

<u>TOPIC: 07 – PLOTTING OF DRAWING.</u>   **[04]**

<u>TOPIC: 08 – THREE DIMENSIONAL DRAWING:</u>   **[08]**

08.01   3 D Modeling, Conversion of orthographic drawing, Z-plane viewing Topographic Map

         Drawing, Polylines Perspective View.

Books Recommended:

1.	Computer Fundamental.	-	Dr. B. Ram.
2.	Computer Today (III Edition)	-	D. H. Sandrs.
3.	Principles of Computer Aided Design.	-	Joe Rooney and Philip.
4.	Computer Aided Electronic Circuit Design.	-	Raghuram
5.	AutoCAD.	-	Rice
6.	AutoCAD.	-	Oumera

MECHANICS OF STRUCTURE

Subject Code **15503**	Theory			No of Period in one session : 60		
	No. of Periods Per Week			**Full Marks**	**:**	**100**
	L	**T**	**P/S**	**Annual Exam.**	**:**	**80**
	06		**-**	**Internal Exam.**	**:**	**20**

Rationale and Objective:

     The Subject Mechanics of Structure forms a core subject for developing the concepts required in the design of various structures. The application of theoretical principles to practical field situation is essential. Integration of the principles to field problems would help the students in understanding the concepts.

     Students will be able to:-

- know various elements of structures
- understand the basic principles
- analyse a given problems

Apply the basic principles in the problems

S.No.	Topics	Periods
01	Principal planes and stresses.	(09)
02	Stresses in beam.	(08)
03	Combined direct and bending stress.	(14)
04	Fixed & continuous beam.	(08)
05	Slope and deflection of beam.	(09)
06	Columns and struts.	(06)
07	Torsion.	(06)
	Total :	**(60)**

CONTENTS:

TOPIC: 01 – PRINCIPLE PLANES AND STRESSES: [09]

01.01 Definition of principal planes and principal stresses.

01.02 Different state of stresses – Normal stresses; tangential stresses on oblique planes of a body subject to axial stresses.

01.03 Normal and tangential stresses on oblique planes of a body subjected to stresses acting on two mutually perpendicular planes with or without shear stress.

01.04 Resultant stresses on oblique plane, principal stresses and principal planes, maximum shear stress and its planes. Condition for oblique plane to be principal plane.

01.05 Analytical and graphical (Mohr's circle) solutions. Diagrammatic representation of principal planes, Principal stresses, shear stress, Resultant Stress and its obliquity, Maximum obliquity.

TOPIC: 02 – STRESSES IN BEAM: [08]

02.01 Theory of simple bending, position of neutral axis, moment of resistance.
Distribution of bending stress across the section, bending stress in symmetrical and unsymmetrical section Modulus, flexural strength of a section.

02.02 Shearing stress at a section in loaded beam, Distribution of shear stresses over Rectangular, circular, I,T.-section, & Channel Section.

02.03 Relation between maximum and average shear stress.

TOPIC: 03 – COMBINED DIRECT AND BENDING STRESS: [14]

03.01 Concept of direct and eccentric loads, eccentricity about one principal axis or both principal axis. 2

03.02 Stress distribution, nature of stress condition for no tension or zero stress at one extreme fibre, limit of eccentricity, Middle third rule, core or kernal of Section for various section columns. 3

03.03 Columns and chimney subjected to lateral wind pressure stress distribution at base. 3

| 03.04 | Analysis of dam (Rectangular & Trapezoidal without battered fall). Stability of a dam, Minimum bottom width required for a dam section and pressure distribution at the base. | 6 |

TOPIC: 04 – FIXED AND CONTINEOUS BEAM: [08]

04.01   Concept of fixity, effect of fixity, advantages and disadvantages.

04.02   Fixed end moments, its nature, bending moment and shear force diagrams for fixed beams of uniform section subjected to concentrated loads and uniformly distributed loads over entire span or a part of span.

04.03   Continuous beam-Introduction, theorem of three moments equation. Continuous beam subjected to point load, u.d.l., their B.M.D & S.T.D.

TOPIC: 05 – SLOPE AND DEFLECTION OF BEAM: [09]

05.01   Concept of slope and deflection, stiffness of beam. Slope and deflection of members subjected to pure bending moments for statically determinate beam, Relation between slope, deflection and radius of curvature.

05.02   Differential equation method of calculating deflection & slope.

05.03   Maccaulay's method, Moment area method.

05.04   Slope & deflection for simply supported, cantilever and over hanging beam subjected to U.D.L & concentrated loads.

05.05   Introduction of propped cantilever propped at mid of simply supported for U.D.L over entire span.

TOPIC: 06 – COLUMNS & STRUTS: [06]

06.01　　Definition and classification, and end condition, assumptions.

06.02　　Buckling of axially loaded compressive members, effective length, radius of gyration, slenderness ratio.

06.03　　Euler's theory for long columns, buckling load, safe load, limitation of Euler's theory.

06.04　　Emprical formula, Rankine formula, I.S. code formula, Johnson's formula.

TOPIC: 07 – TORSION: [06]

07.01　　Concept of torsion and twisting moment theory of pure torsion, twist angle, polar moment of Inertia. Torsional equation, Polar modulus, Torsional rigidity.

07.02　　Power transmitted by a shaft, shear stress distribution across a section of solid and hollow circular shaft.

07.03　　Torsion of composite concentric shaft.

Books Recommended:

1.	Strength of materials	- M.Chakraborti
2.	Mech. of Structure vol I & II	- S.B. Junarkar
3.	Strength of materials	- R.S. Khurmi
4.	Programmed text in Strength of material	- T.T.T.I. Chandigarh
5.	Theory of Structures vol I & II	- Vazirani & Ratwani
6.	Strength of materials	- Ramarutham
7.	Strength of material Part I& II	- B.N. Bose
8.	Strength of materials	- G.H. Ryder
9.	Teaching plan of Strength of materials	- T.T.T.I. Madras

HYDROLOGY AND IRRIGATION ENGINEERING

Subject Code	Theory			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
15504	L	T	P/S	Annual Exam.	:	80
	06	-	-	Internal Exam.	:	20

Rationale:

Knowledge of Hydrology facilitates the engineers to estimate amount of water which can be stored or diverted for irrigation purpose. Irrigation is a multi disciplinary subject which is related mainly to Engineering as well as Agriculture and others. So far as construction and maintenance of works to obtain water from the source and lead it to the field is concerned, it is a part of engineering when as proper quantity and by best method is concerned it is a part of agriculture. But to ensure a correct and economical design of an irrigation system an engineer must be familiar with the latter aspects of irrigation, as well. Therefore the technicians of civil Engg. should acquire the knowledge of Hydrology and Irrigation Engineering for need of rising population of the country.

Objective:

The broad objectives of this paper are the following :

1. The technicians should be able to improve the area under his system by not only supplying the supplemental needs of the crops for water but also by improving the drainage where necessary for taking improved yields from the land

2. They may, also, be able to under take the reclamation of waste and alkaline lands where this can be carried out through the agency of water.

3. They should know the process of development of single and for multi purpose water resources projects, management of floods.

In order of obtain the above objectives the following topics are introduced:

S.No.	Topics	Periods
01	Introduction.	(02)
02	Hydrology.	(08)
03	Water Requirement of corps.	(06)
04	Lift Irrigation.	(06)
05	Flow Irrigation.	(10)
06	Diversion Headworks.	(06)
07	Storage Headworks.	(04)
08	Irrigation Structures.	
(a)	Cross Drainage works.	(03)
(b)	Head Regulators cross Regulators, falls, escape and Regulators	(03)
09	River Training works and Flood Management	(06)
10	Miscellaneous topics	(06)
	Total :	**(60)**

CONTENTS:

TOPIC: 01 – INTRODUCTION : [02]

Water Resources of India with special references to Bihar, Definition of Hydrology and Irrigation necessacity and importance, advantages and disadvantages of irrigation, development of irrigation facilities in India with special reference to Bihar.

TOPIC: 02 – HYDROLOGY: [08]

Scope and Hydrologic cycle, rain fall and its measurement, raingauges automatic and non-automatic, average rainfall over catchment, types of catchment runoff.

(i) HFL data section of a straight reach stream and
(ii) Catchment area formula, stream gauging, measurement of stream flow.

TOPIC: 03 – WATER REQUIREMENTS OF CROPS : [06]

Function of water in plant growth, consumptive use of water, crops seasons of Bihar, important crops of Bihar, crops water Requirements Duty, delta and base period concept, Climatological approach (Modified panmen method only) Irrigation frequency. Gross command area culturable command Area, intensity Irrigation and elementary knowledge of soils in relation to crops.

TOPIC: 04 – LIFT IRRIGATION : [06]

Necessity, advantages, limitations, Different Lifting methods : manual and machnical wells – location, different types, construction of wells.
Tube wells – Types and methods of boring, yield of wells – Derivation of the formula Merits and demerits of well irrigation.

TOPIC: 05 – FLOW IRRIGATION : [10]

Introduction, classes of irrigation canals, canal alignment, typical cross section of canals, layout of main canal, branch canal and distribution system, design of regime irrigation canals by Lacry's formula and Kennedy's theory, Kutter's and Mannings formulae, canal lining – purpose, advantages and disadvantages.

TOPIC: 06 – DIVERSION HEAD WORKS : [06]

Definition, object, general layout of a diversion head works, function of different component parts.

(a) Weir–types, masonery weir, concrete weir, rockfill weir, functions of weir, typical cross section of a concrete weir.
(b) Barrages – Use and their functions, components parts divide wall, under sluice, fish ladder, head regulator, aprons etc. And typical cross section of a barrage.

TOPIC: 07 – STORAGE HEAD WORKS : [04]

(a) Dams – Types – Concrete dam, Rock fill dams and earthen dams, essential characteristics of dam with their component parts, condition of stability of dams, causes of failure of earthen dams, seepage in earthen dams and its control through drainage.
(b) Spillways and Gates – Functions, elementary idea of different types of spillways and gates.

TOPIC: 08 – IRRIGATION STRUCTURES : [06]

(a) Cross drainage works – Functions, types, aquaduct, siphon, syphonic aquaduct, super passage, inlet and outlets, level crossing.
(b) Head regulators, cross regulators, falls and escapes.

TOPIC: 09 – RIVER TRAINING WORKS AND FLOD MANAGEMENT : [06]

Functions, stages of river, meandering of rivers, methods of river training cut offs marginal and retired embankments, guide bunds, spurs or groynas dykes, bank protection works: preventive and curative measures of flood management.

TOPIC: 10 – INTRODUCTION : [06]

(a) Siltation in canals, their causes and remedy.
(b) Waterloging – Causes and preventive measures, reclamation of waterlogged areas, curative and preventive methods.
(c) Soil conservation methods.
(d) Sprinkler irrigation and drip irrigation.

Books Recommended:

1.	Fundamentals of Irrigation Engineering, Nemechand and Bros, Civil –Lines,Roorkee.	-	Bharat Singh.
2.	Irrigation and water power, Standard Publishers and Distrubuters, Nai Sarak, Delhi –6	-	B. C. Punamia & Pandey.
3.	Engineering Hydrology.	-	B.B. Lal.

Reference Books :

1.	Design of Irrigation Sructures.	-	Varsheney & Gupta.
2.	Hydrology	-	Varsheney & Gupta.
3.	Irrigation Engineering, TMH.	-	Mazumadar.
4.	Soil and water conservation Engineering, Standard Publishers and Distributers, Nai Sarak, Delhi-6	-	R. Suresh.
5.	flapkbZ baftfu;jhax	-	xq:pj.k flag
6.	flapkbZ baftfu;jhax	-	fla?ky
7.	flapkbZ baftfu;jhax	-	Mh0nkl
8.	Engineering Hydrology	-	Subramaniam.
9.	Irrigation Engineering	-	Bharat Singh.
10.	Elementary Irrigation Engineer	-	S.k. Garg.
11.	Irrigation Engineering	-	Shahastra Budhi
12.	Irrigation & water Power Engg.	-	Punamia
13.	Irrigation & water Power Engg.	-	Pryani
14.	Applied Hydrology	-	Bhattachaya
15.	Irrigation practive & Design	-	Khaslani
16.	Irrigation Engg.	-	B.L. Gupta

QUANTITY SURVEYING & COSTING - II

Subject Code **15505**	Theory			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	06	-	-	Internal Exam.	:	20

Rationale & Objective:

       Calculation of the detailed quantities of materials and working out their costs for all projects, minor or major, is the major objective of a junior Engineer / Technician. As the calculations are based on the detailed drawings of the structure / project, the junior engineer / technician must be thoroughly conversant with the drawings so as to be committed to the structure / project. The student must be supplied with the required drawings by the institution and the subject be taught with a more practical basis.

       After going through the course, a student is expected to develop the knowledge and understanding of the terms associated with the subject. He is able to develop the skill to estimate the quantity of the materials as well as to calculate the cost involved there in.

S.No.	Topics	Periods
01	Estimate of R. C. C. and steel works.	(20)
02	Estimate of Bridges and Culverts.	(10)
03	Water Supply and Sanitary works.	(08)
04	Specifications.	(08)
05	Analysis of Rates.	(08)
06	Valuation.	(06)
	Total :	**(60)**

CONTENTS:

TOPIC: 01 – ESTIMATE OF R. C. C. AND STEEL WORKS:　　　　　　[20]

01.01   Estimate of R. C. C. slab, beam & T-beam.

01.02   Estimate of a column with foundation.

01.03   Estimate of a cantilever Retaining wall.

01.04   Estimate of a steel roof truss.

TOPIC: 02 – ESTIMATE OF BRIDGES AND CULVERTS:　　　　　　[10]

02.01   Estimate of a R. C. C. slab culvert.

02.02   Detailed estimate of a slab culvert with splayed wing walls and Return walls.

TOPIC: 03 – WATER SUPPLY AND SANITARY WORKS:　　　　　　[08]

03.01   Estimate of water-supply and sanitation works for residential buildings.

TOPIC: 04 – SPECIFICATIONS:　　　　　　[08]

04.01   General.

04.02   Aims of Specification.

04.03   Types of Specification.

04.04   Method of preparation of specification.

04.05   General and detailed specification.

04.06   Specification for the following items of works.

04.06.01   P. C. C. / R. C. C. work in foundation.

04.06.02   Damp proof course at plinth.

04.06.03   Brickwork in foundation, plinth and super structure.

04.06.04   R. C. C. work in beams and slabs.

04.06.05   Patent stone flooring.

04.06.06   Plastering.

04.06.07   Lime Terracing.

TOPIC: 05 – ANALYSIS OF RATES: **[08]**

05.01   Purpose.

05.02   Importance, Requirement and procedure of Rate-Analysis.

05.03   Factors affecting rate analysis.

05.04   Analysis of rates for the following items of works:

05.04.01   L. C. / P. C. C. in foundation.

05.04.02   R. C. C. work in foundation.

05.04.03   Brickwork in foundation, plinth and super structure.

05.04.04   R. C. C. work in beams and slabs.

05.04.05   Patent-stone flooring.

05.04.06   Terrazo flooring.

05.04.07   Plastering.

TOPIC: 06 –WATER APPLICATION METHODS AND THEIR EFFICIENCIES: **[06]**

06.01   Objects of valuation.

06.02   Importance and methods of valuation.

06.03   Different forms of value.

06.04   Outgoing and depreciations.

06.05   Mortage and assessment rights.

06.06   Year's purchase and security.

06.07   Valuation based on gross income, net income and capitalised value.

06.08   Fixation of rent as per P. W. D. practice.

06.09   Fixation of municipal taxes.

Books Recommended:

1.	Estimating & Costing	-	B. N. Dutta
2.	Estimating & Costing	-	G. S. Birdi
3.	Estimating & Costing	-	M. Chakraborty
4.	Estimating & Costing	-	Rangwall
5.	Valuation	-	Rangwall
6.	Civil Engg. Contract & Estimate		B. S. Potio

COMPUTER APPLICATION LAB (CADD)

Subject Code 15506	Practical			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	50
	L	T	P/S	Annual Exam.	:	40
		-	04	Internal Exam.	:	10

Rationale:

It is the age of computer. Architect / Engineers prepares most accurate and descent presentation of plans to satisfy the clients. Use of computer software such as AutoCAD, Felix Cad, Auto Civil enables Civil Engineers to prepare quality drawings in shortest possible time. This helps in reduction in the laborious, tedious work of draftsmanship. Working drawings are also prepared with the help of computer. In view of this computer aided drawing has been included in the present curriculum.

Objectives:

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.

Practical:

A) Building Drawing: **40**

Following exercises shall be completed with CAD software and Print of all the drawings should be Prepared on A3 / A4 size paper
1) Preparation of line plan of a residential building.
2) Preparation of line plan of a Public building.
3) Preparation of detailed plan of a two room residential building.
4) Preparation of submission drawing of residential building – showing Plan, Elevation, Section, Schedule of openings, Site Plan and Area Statement

B) Civil Engineering Drawing.   **20**

Preparation of Drawings with CAD software for the following exercises (Any THREE) and Print of all the drawings should be prepared on A3 /A4 size paper.
1) Plan, Cross Section and Longitudinal section of a Culvert (Pipe culvert/Box Culvert).
2) Section of an Earthen Dam.
3) Cross Section of Retaining wall.
4) Bonds in brickwork – Plan and Elevation for English bond and Flemish bond for one Brick thick wall

Reference Books:

Sl. No.	Title	Author
1.	Reference Manual of AutoCAD	AutoDesk
2.	Reference Manual of Felix cad	Felix CAD
3.	Reference Manual of Intel CAD	
4.	Reference Manual of Auto Civil	
5.	Reference Manual of 3D-Max	

CIVIL ENGINEERING LAB

Subject Code **15507**	Practical			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	-	-	04	Internal Exam.	:	20

Rationale and Objectives:

The civil engineering laboratory is a subject which will help student to understand the theory that he has studied by performing experiments and verifying results.

Besides the above the objective of the course are to develop measuring skills, skill to observe experimental date, put the data in a tabular form, draw graphs, read the graph and analyse the result. It will bring confidence in a student.

CONTENTS:

Preparation of Journal based on any eight experiments of the following:-

01   Determination of fineness modular of fine aggregate.

02   Determination of fineness modular of course aggregate.

03   Determination of bulking the sand.

04   Determination of Thickness index and elongation index of aggregate.

05   Determination of Normal consistency of cement.

06   Determination of Intial setting time of comment.

07   Determination of Final setting time of comment.

08   Determination of Soundness of comment.

09   Determination of tensile strength of cement after 3 days & after 7 days curing.

10   Determination of compressible strength of concrete after 7 days; 14 days &28 days of curing of M 15 grade of concrete.

11   Slump test.

12   Determination of turbidity of water.

13   Determination of PH value of water.

14   Determination of flash point of bitumen by a bell's flash point appration or by pensky master apparatus.

15   Determination of softening point of bituminous material by Ring and Bell apparatus.

16   Determination of consistency of bituminous material by penetration test.

17   Abrasion test of road material.

Books Recommended:

1.	Lab manual for soil mechanics, material testing, standard publishers & distributors Delhi.	-	Water & Bitumen.
2.	Material testing lab manuals.	-	Kanshik.
3.	Strength of materials.	-	T.T.T.I. Madras.

QUANTITY SURVEYING & COSTING - II

Subject Code **15508**	Sessional			No of Period in one session : 50		
	No. of Periods Per Week			Full Marks	:	50
	L	T	P/S	Annual Exam.	:	30
	-	-	4	Internal Exam.	:	20

Rationale:
        This is a core technology subject which will enable the students to learn core facts, concepts, principles & procedures in Estimating & Costing. With this knowledge and skill, he will be able to prepare estimate before start of construction and systematically procure materials during execution using specifications for ensuring appropriate type of construction processes & quality of engineering products in specialized areas in Building Construction, Irrigation, Transportation and Environmental Engineering.

Objectives:
Students should be able to:
1) Decide Approximate Cost of Civil Engineering Structure.
2) Prepare check list of items of construction.
3) Prepare estimate for civil engineering work.
4) Prepare rate analysis of item of construction.
5) Take measurement of completed work.
6) Compare actual quantity with estimated quantity.

Assignments:
Skills to be developed:

Intellectual Skills:
        a. List various items of work with their units in a Civil Engineering Structure.
        b. Calculate quantities of various items of work.
        c. Prepare rate analysis.

List of Sessional Work:
1) Prepare Check list of items of following type of Civil Engineering works.
        a) Load Bearing type Building
        b) Framed structure type building
        c) W.B.M.Road
        d) Septic Tank
        e) Community well
2) Writing the rules of deduction's for below mentioned items of work as per IS 1200.
        a) Brick / Stone masonry.
        b) Plastering / Pointing
3) Taking out quantities of various items of work for load bearing building.
        i) Earth work in excavation for foundation
        ii) Base Concrete of foundation
        iii) U.C.R./BB Masonry work in foundation and plinth.
        iv) D.P.C.
        v) Plinth Filling.
        vi) Brick work in masonry.
        vii) Flooring
        viii) Plastering.
        ix) Wood work in doors & windows
4) Taking out quantities of following items for small R.C.C. Hall
        i) Concreting for footing, Column, Beam, slab.
        ii) Reinforcement for above items by preparing Schedule of bars.
        iii) Form work for all above items.
5) Preparing detailed estimate of a RCC single & two storied residential building for
        all items of work. (The quantity of reinforcement shall be calculated by percentage.)
6) Preparing Rate analysis of following items:
        Building work – Brick work, P.C.C., R.C.C., Plastering, Flooring, Doors, Windows.
7) Taking out quantities of earth work for a Road profile prepared in surveying subject.
        Prepare the lead statement.
8) Taking out quantities of work for a Community well or Jack well or Septic Tank.
9) Taking out quantities of work for pipe culvert.

        (Drawings shall be provided for the above exercises by subject teacher.)

1. **Reference Books:**

Sl. No.	Title	Author	Publisher
1.	Estimating & costing in Civil Engineering	B.N. Datta	UBS Publishers Distributors Pvt Ltd New Delhi
2.	Estimating & costing, Specification and Valuation in Civil Engineering	M. Chakraborti	M. Chakraborti , Calcutta
3.	Estimating & costing	S.C. Rangwala	Charotar Publication Anand
4.	Civil Engineering Estimating, Contracts and accounts Vol . I	B.S. Patil	Orient Longman, Mumbai
5.	Estimating & costing	G. S. Birdie	Dhanpat Rai and Sons Delhi

2. **Video Cassettes /CDS:**

Sl. No.	Title
1.	Q. E. PRO software

3. **IS/INTERNATIONAL CODES:**

Sl. No.	Title
1.	IS 1200- Method of Measurement of building and Civil engineering works

IN PLANT TRAINING & VISIT TO WORK

Subject Code **15509**	Sessional			No of Period in one session :		
	No. of Periods Per Week			Full Marks	:	50
	L	T	P/S	Annual Exam.	:	30
	4 Weeks Continuous			Internal Exam.	:	20

Rationale:

A student is required to develop his knowledge skill and attitudes gained while joining through different course. It is desirable to expose the students to the world of work to be familiar with the real life situations and understand the problem there in. The "In plant training and visit to work "being introduced for the final year diploma technicians for Civil Engineering with the above objective in view. This course will help the students to observe how the technical, managerial, quality control safety and other principle are being applied in real life situation. They will be able to observe the technique of decision making on the shop floor. He will also, be able to observe the technique of decision making on the shop floor. He will, also be able to observe how his sub-ordinate perform in their day to day work and co-ordinate shop floor activities. The course will also, help bring attitudinal changes in a student.

Objective:

A student will be able to:

- Understand the working of the machines, tools and equipments more clearly.
- Write down the specifications of the machines, tools, equipments.
- Know the process of material storing / material management.
- Learn to maintain office records / filing.
- Know the process of planning, implementation and monitoring.
- Learn the skill shop floor co-ordination.
- Know the skill of office management and inventory Control.
- Understand the process of production.
- Know the skill of quality control.
- Know the organizational set-up and plant Layout.
- Locate the plants and industries related to Civil Engineering State and Nation wise.
- Find out Characteristics, Functions, and activities of those industries.
- Find out opportunities and method of recruitments.
- Know the source of raw materials and markets for industries.
- Find out the special characteristics of the industries.
- Observe and understand special machines, which they may not have been in their institutes.
- Observe the energy consumption in on industry method to same energy.
- Try to learn techniques to same energy.
- Observe the environment Pollutants and learn how to minimize environmental Pollution.

CONTENTS

Part-A

Inplant Training

The training of the students should be in any organisation, which is involved in :

S.No.	Topics
01	Civil construction work.
02	Civil Design work.
03	Irrigation.
04	Planning & Erection.
05	Any other which is relevant to civil Engineering.

Part-B

Visit to Works

Project studies (Visit to works)**:** Journal in respect of study of any TWO of the following Project:

S.No.	Topics

S.No.   **Topics**

01   An Irrigation Project:-

- Study of different elements of a Dam/Barrages,
- Site including river training works,
- Silt excluder,
- Divide wall,
- Head regulator,
- Scour Slice gates,
- Intake of main canal
- Cross Regulators
- Cross Drinage Works
- Spillway, etc.

02   A multi storeyed Framed Building Project under construction:

- Study of different components of Buildings including
- Sub-structure and super-structure
- Study of re-inforcement used in different members,
- Details of concrete sections,
- Details of joints,
- Construction
- Planning
- Erection Technique

03   A reinforced cement concrete or a pre-stressed concrete of a steel:

- Bridge project
- Study of different members
- Support conditions
- Connection between members
- Details of Joints
- Associated River traning works

04   A Road project under construction:

- Alignment of Road
- Data of sub-structures and super structures of Road
- Study of geometrical elements & junctions

05   A water supply scheme:

- Study of works at source
- Water Purification system
- Water testing devices
- Storage system
- Pumping system
- Supply net-work

06   A Sewerage System:

- Study of collection system
- Sewer network
- Pumping station
- Sewerage Treatment Plant
- Disposal of sludge and water

07   A Railway Station Yard:

- Study of Railway Yard including Plot form
- Tracks
- Signals
- Interlocking system
- Points & Crossings
- Regulation of Rolling stock

REPORT WRITING:

Report writing the report on each project/ scheme shall include sketches, wherever necessary, of all works studied with relevant data.