	CAPITAL SCHOOL OF ENGINEERING
PLOT NO. 1288, MAHATAPALLA, BAJAPUR, KHURDA,PIN-752060	
Session: 2023-2024	
Course Name: DIPLOMA	**Branch Name:** CIVIL
Subject Name: TH 5 : Estimating &	**Theory/Practical:** Theory
Section: A	**Teacher Name:** SUBHA SMARANIKA SWAIN
Semester: 5	

Credit '3' External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Estimating,Costing,specification &Valuation in Civil Engineering by
2	Estimating &Costing by UBSPD
3	Estimating &Costing by Dhanpat Rai Publication

Reference books:

Sl.No	Reference books
1	Latest Orissa PWD Schedule of Rates & Analysis of rates (Govt. of Odisha)

Course Outcomes:

Sl.No	Course Outcomes
1	Create detailed estimate of culverts and bridges
2	Prepare estimates of irrigation structures
3	Prepare estimates of a macadam road and a national highway in cutting and filling
4	Prepare detailed estimates of miscellaneous works
5	Comprehend the management practices in Public Works Department

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1-6	Detailed estimate of culverts and bridges	RCC slab culvert with right angled wing walls with bar bendind	Cos 1	
2	7-12	Detailed estimate of culverts and bridges	with splayed angled wing wall	Cos 1	
3	13-19	Estimate of irrigation structures	simple type of vertical fall to given specification	Cos 2	

4	20-26	Estimate of irrigation structures	drainage siphon to given specification	Cos 2	
5	27-30	Detailed estimation of roads	water bound macadam road	Cos 3	
6	31-34	Detailed estimation of roads	flexible pavement in cutting / filling	Cos 3	
7	35-38	Detailed estimation of roads	septic tank and soak pit for 50 users	Cos 3	
8	39-50	Miscellaneous estimates	cap, Isolated and combined footings	Cos 4	
9	51	PWD Accounts works	work-original, major, petty, repair work, annual repair, special	Cos 5	
10	52	PWD Accounts works	execution of works through the contractors and department, contract and agreement, work	Cos 5	
11	53-54	PWD Accounts works	Explanation of various terms Administrative approval, technical sanction, tender,	Cos 5	
12	55	PWD Accounts works	& maintenance, procedure of marking entries of measurement of work and supply of	Cos 5	
13	56	PWD Accounts works	preparation & use for making payment of pay	Cos 5	
14	57	PWD Accounts works	preparation & use for making payment of pay	Cos 5	
15	58	PWD Accounts works	method of labour payment, use of forms and necessity of	Cos 5	
16	59	PWD Accounts works	receipt / issue statement on standard form, method of preparation of stock account,	Cos 5	
17	60	PWD Accounts works	REGULATORY Bodies, Development authorities, types and their levels, RERA etc	Cos 5	

Subha

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Session: 2023-2024	
Course Name: DIPLOMA	**Branch Name:** CIVIL
Subject Name: TH 2 : Structural Design-II	**Theory/Practical:** Theory
Section: A	**Teacher Name:** SASHI BUDHIA
Semester: 5	

Credit '3' External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Design of Steel Structures by B.N.Duggal, McGraw Hill Education
2	Elements of Steel ,Timber & Masonry Design by Samal & Panigrahi, Kalyani Pbln

Reference books:

Sl.No	Reference books
1	Steel Tables by Samal & Panigrahi, Samal & Panigrahi
2	I.S 800-Code of practice for General construction in steel

Course Outcomes:

Sl.No	Course Outcomes
1	Design simple steel structure such as tension members, compression members and simple beams.
2	Design timber structural elements
3	Design staircase, footings by limit method of design
4	Draw the details of a steel roof truss
5	Draw the reinforcement details of underground RCC water tank and RCC footings
6	Use standards and design codes

SL	Lectur	Module/Unit No.	Topic To Be Taught	Cos	Reference Material
1	1	Introduction	Common steel structures, Advantages & disadvantages of steel structures.	Cos 1	
2	2	Introduction	Types of steel, properties of structural steel. Rolled steel sections, special considerations in steel design. Loads and load c	Cos 1	
3	3	Introduction	Structural analysis and design philosophy. Brief review of Principles of Limit State design.	Cos 1	
4	4	Structural Steel Fasteners and Connections	Bolted Connections	Cos 1	

5	5	Structural Steel Fasteners and Connections	Classification of bolts,	Cos 1	
6	6	Structural Steel Fasteners and Connections	Different terminology, spacing and edge distance of bolt holes	Cos 1	
7	7	Structural Steel Fasteners and Connections	Types of bolted connections	Cos 1	
8	8	Structural Steel Fasteners and Connections	Types of action of fasteners, assumptions	Cos 1	
9	9	Structural Steel Fasteners and Connections	Analysis	Cos 1	
10	10	Structural Steel Fasteners and Connections	Efficiency of a joint.	Cos 1	
11	11	Structural Steel Fasteners and Connections	Welded Connections	Cos 1	
12	12	Structural Steel Fasteners and Connections	Advantages and Disadvantages of welded connection	Cos 1	
13	13	Structural Steel Fasteners and Connections	Design stresses in welds.	Cos 1	
14	14	Structural Steel Fasteners and Connections	Strength of welded joints.	Cos 1	
15	15	Design of Steel tension Members	Common shapes of tension members	Cos 1	
16	16	Design of Steel tension Members	Maximum values of effective slenderness ratio	Cos 1	
17	17	Design of Steel tension Members	Analysis and Design of tension members	Cos 1	
18	18	Design of Steel Compression members	Common shapes of compression members	Cos 1	
19	19	Design of Steel Compression members	Buckling class of cross sections, slenderness ratio	Cos 1	
20	20	Design of Steel Compression members	Design compressive stress and strength of compression members	Cos 1	
21	21	Design of Steel Compression	Analysis	Cos 1	
22	22	Design of Steel Compression members	Design of compression members (axial load only).	Cos 1	
23	23	Design of Steel beams	Common cross sections	Cos 1	
24	24	Design of Steel beams	Their classification, Deflection limits,	Cos 1	
25	25	Design of Steel beams	web buckling.	Cos 1	
26	26	Design of Steel beams	web crippling	Cos 1	
27	27	Design of Steel beams	Design of laterally supported beams against bending and shear	Cos 1	
28	28	Design of Tubular Steel Structures	principles of design	Cos 2	
29	29	Design of Tubular Steel Structures	Strength of plates in a joint	Cos 2	
30	30	Design of Tubular Steel Structures	strength of bearing type and shear capacity of HSFG bolts	Cos 2	
31	31	Design of Tubular Steel Structures	shear capacity	Cos 2	
32	32	Design of Tubular Steel Structures	reduction factors	Cos 2	
33	33,34	Design of Tubular Steel Structures	HSFG bolts (except eccentric load)	Cos 2	

34	35	Design of Tubular Steel Structures	advantages	Cos 2	
35	36,37	Design of Tubular Steel Structures	disadvantages of bolted connections	Cos 2	
36	38	Design of Tubular Steel Structures	design of Joints using bearing type	Cos 2	
37	39	Design of Tubular Steel Structures	Round Tubular Sections	Cos 2	
38	40	Design of Tubular Steel Structures	Permissible Stresses	Cos 2	
39	41	Design of Tubular Steel Structures	Tubular Compression	Cos 2	
40	42	Design of Tubular Steel Structures	Tension Members	Cos 2	
41	43	Design of Tubular Steel Structures	Joints in Tubular trusses	Cos 2	
42	44	Designof Masonry Structures	Traffic light controller	Cos 3	
43	45	Designof Masonry Structures	Design considerations for Masonry	Cos 3	
44	46	Designof Masonry Structures	walls	Cos 3	
45	47	Designof Masonry Structures	Columns	Cos 3	
46	48	Designof Masonry Structures	Load Bearing	Cos 3	
47	49	Designof Masonry Structures	Tutorial class	Cos 3	
48	50	Designof Masonry Structures	Non-Load Bearing walls	Cos 3	
49	51	Designof Masonry Structures	Permissible stresses	Cos 4	
50	52	Designof Masonry Structures	Slenderness Ratio	Cos 4	
51	53	Designof Masonry Structures	Effective Length, Height &Thickness	Cos 4	

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	CAPITAL SCHOOL OF ENGINEERING
PLOT NO. 1288, MAHATAPALLA, BAJAPUR, KHURDA,PIN-752060	
Session: 2023-2024	
Course Name: DIPLOMA	**Branch Name:** CIVIL
Subject Name: TH 3 : Railway & Bridge	**Theory/Practical:** Theory
Section: A	**Teacher Name:** SUPRIYA PRADHAN
Semester: 5	

Credit '3' External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Railway Engineering by Chandra & Agrawal
2	A Text book of Railway Engineering by S.C.Sexena & S.P.Arora
3	Railway Engineering by S. C. Rangwala
4	Bridge Engineering by S.P. Bindra

Reference books:

Sl.No	Reference books

Course Outcomes:

Sl.No	Course Outcomes
1	Explain railway terminology
2	Comprehend the track components and relate to the material or geometric aspects that can be used for
3	Describe methods of laying and maintaining the track
4	State the requirements for an ideal bridge and describe types of foundation and substructures.
5	Classify the bridges and identify the components

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	Introduction	Railway terminology	Cos 1	
2	2	Introduction	Advantages of railways	Cos 1	
3	3	Introduction	Classification of Indian Railways	Cos 1	
4	4,5	Permanent way	Definition and components of a permanent way	Cos 1	
5	6,7,8	Permanent way	prevalent in India, suitability of these gauges under different conditions	Cos 1	
6	9	Track materials	Rails	Cos 2	
7	10,11,12	Track materials	Functions and requirement of rails	Cos 2	
8	13,14	Track materials	Types of rail sections, length of rails	Cos 2	

9	15,16	Track materials	Rail joints types, requirement of an ideal joint	Cos 2	
10	17,18,19	Track materials	Purpose of welding of rails & its advantages	Cos 2	
11	20,21,22	Track materials	Creep- definition, cause & prevention	Cos 2	
12	23,24	Track materials	Sleepers	Cos 2	
13	25,26	Track materials	Definition, function & requirements of sleepers	Cos 2	
14	27	Track materials	Classification of sleepers	Cos 2	
15	28	Track materials	Advantages & disadvantages of different types of sleepers	Cos 2	
16	29	Track materials	Ballast	Cos 2	
17	30	Track materials	Functions & requirements of ballast	Cos 2	
18	31	Track materials	Materials for ballast	Cos 2	
19	32	Track materials	Fixtures for Broad gauge	Cos 2	
20	33	Track materials	Connection of rails to rail-fishplate, fish bolts	Cos 2	
21	34	Track materials	Connection of rails to sleepers	Cos 2	
22	35,36	Geometric for broad gauge	Typical cross sections of single & double broad gauge railway track in cutting and embankment	Cos 3	
23	37	Geometric for broad gauge	Permanent & temporary land width	Cos 3	
24	38	Geometric for broad gauge	Gradients for drainage	Cos 3	
25	39	Geometric for broad gauge	Super elevation â€“ necessity & limiting valued	Cos 3	
26	40	Points and crossings	Definition, necessity of Points and crossings	Cos 3	
27	41	Points and crossings	Types of points & crossings with tie diagrams	Cos 3	
28	42	Laying & maintenance of track	Methods of Laying & maintenance of track	Cos 3	
29	43	Laying & maintenance of track	MethoDuties of a permanent way inspector ds of Laying & maintenance of track	Cos 3	
30	44	Introduction to bridges	Definitions	Cos 4	
31	45	Introduction to bridges	Components of a bridge	Cos 4	
32	46	Introduction to bridges	Classification of bridges	Cos 4	
33	47	Introduction to bridges	Requirements of an ideal bridge	Cos 4	

34	48	Bridge site investigation, hydrology & planning	Selection of bridge site, Alignment,	Cos 5	
35	49	Bridge site investigation, hydrology & planning	Determination of Flood Discharge	Cos 5	
36	50	Bridge site investigation, hydrology & planning	Waterway & economic span	Cos 5	
37	51	Bridge site investigation, hydrology & planning	Afflux, clearance & free board	Cos 5	
38	52	Bridge foundation	Scour depth minimum depth of foundation	Cos 5	
39	53	Bridge foundation	Types of bridge foundations spread foundation, pile foundation- well foundation sinking of wells, caission foundation	Cos 5	
40	54	Bridge foundation	Coffer dams	Cos 5	
41	55	Bridge substructure and approaches	Types of piers	Cos 5	
42	56	Bridge substructure and approaches	Types of abutments	Cos 5	
43	57	Bridge substructure and approaches	Types of wing walls	Cos 5	
44	58	Bridge substructure and approaches	Approaches	Cos 5	
45	59	Culvert & Cause ways	Types of culvers brief description	Cos 5	
46	60	Culvert & Cause ways	Types of causeways brief description.	Cos 5	

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PLOT NO. 1288, MAHATAPALLA, BAJAPUR, KHURDA,PIN-752060
Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory

Section : A
Semester : 5

Branch Name: CIVIL
Subject Name: TH 4 : Water Supply & Waste Water Engineering
Teacher Name: ANURADHA PANDA

Credit " External Evaluation(Marked) " Internal Evaluation(Marked) "

Text Books:

Sl.No	Text Books
1	Water Supply Engineering-Environmental Engineering v.1 by S.K.Garg, Khanna Publishers
2	Sewage Disposal and Air Pollution Engineering - Environmental Engineering v.2 by S.K.Garg, Khanna Publishers
3	Water Supply and Sanitary Engineering by B.S.BirdiDhanpat Rai Publishing Company
4	Water Supply Engineering by B. C. Punmia and A.K.Jain, Laxmi Publications

Reference books:

Sl.No	Reference books
1	Water and Wastewater Technology by M.J. Hammer, PHI

Course Outcomes:

Sl.No	Course Outcomes
1	Students will be able to learn about the Water Supply System and Analysis of Water
2	Students will be able to learn about the sources of water, intakes & pumps
3	Students will be able to learn about water treatment process
4	Students will be able to learn about the water distribution system
5	Students will be able to learn about the general layout of plumbing
6	Students will be able to learn about the sanitary system
7	Students will be able to learn about the numericals on quantity of sanitary sewage
8	Students will be able to learn about the sewage system
9	Students will be able to learn about the disposal system
10	Students will be able to learn about the treatment process
11	Students will be able to learn about the drainage system

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	Necessity of treated water supply	Cos 1	
2	2	1	Per capita demand, variation in demand, and factors affecting demand	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
3	3	1	Methods of forecasting population, Numerical problems using different methods	Cos 1	
4	4	1	Impurities in water – organic and inorganic, Harmful effects of impurities	Cos 1	
5	5	1	Analysis of water –physical test	Cos 1	
6	6	1	Analysis of water –chemical test	Cos 1	
7	7	1	Analysis of water –bacteriological test	Cos 1	
8	8	1	Water quality standards for different uses	Cos 1	
9	9	1	Numericals	Cos 1	
10	10	1	Numericals	Cos 1	
11	11	2	Surface sources– Lake, stream, river, and impounded reservoir	Cos 2	
12	12	2	Underground sources– aquifer type & occurrence– Infiltration gallery, infiltration well, springs, well	Cos 2	
13	13	2	Yield from well- methods of determination, Numerical problems using yield formulae	Cos 2	
14	14	2	Intakes – types, description of river intake, reservoir intake, canal intake	Cos 2	
15	15	2	Pumps for conveyance & distribution – types, selection, installation	Cos 2	
16	16	2	Pipe materials – necessity, suitability, merits & demerits of each type	Cos 2	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
17	17	2	Pipe joints – necessity, types of joints, suitability, methods of jointing, Laying of pipes – method	Cos 2	
18	18	2	Numericals	Cos 2	
19	19	2	Numericals	Cos 2	
20	20	2	Numericals	Cos 2	
21	21	3	Flow diagram of conventional water treatment system	Cos 3	
22	22	3	Treatment process/units	Cos 3	
23	23	3	Aeration; Necessity	Cos 3	
24	24	3	Plain Sedimentation: Necessity, working principles	Cos 3	
25	25	3	Sedimentation tanks – types, essential features, operation & maintenance	Cos 3	
26	26	3	Sedimentation with coagulation: Necessity, principles of coagulation	Cos 3	
27	27	3	Flash Mixer, Flocculator, Clarifier	Cos 3	
28	28	3	Filtration: Necessity, principles	Cos 3	
29	29	3	Slow Sand Filter, Rapid Sand Filter, and Pressure Filter	Cos 3	
30	30	3	Disinfection: Necessity, methods of disinfection	Cos 3	
31	31	3	Chlorination– free and combined chlorine demand	Cos 3	
32	32	3	Available chlorine, residual chlorine, pre-chlorination, breakpoint chlorination, super-chlorination	Cos 3	
33	33	3	Softening of water – Necessity	Cos 3	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
34	34	3	Methods of softening – Lime soda process and Ion exchange method	Cos 3	
35	35	4	General requirements, types of distribution system-gravity, direct and combined	Cos 4	
36	36	4	Methods of supply – intermittent and continuous	Cos 4	
37	37	4	Distribution system layout – types, comparison, suitability	Cos 4	
38	38	4	Valves-types, features, uses	Cos 4	
39	39	4	Purpose-sluice valves, check valves, air valves	Cos 4	
40	40	4	Scour valves, Fire hydrants, Water meters	Cos 5	
41	41	5	Method of connection from water mains to building supply	Cos 5	
42	42	5	General layout of plumbing arrangement for water supply in single-storied building	Cos 5	
43	43	5	General layout of plumbing arrangement for water supply in multi-storied building	Cos 5	
44	44	6	Aims and objectives of sanitary engineering	Cos 6	
45	45	6	Definition of terms related to sanitary engineering	Cos 6	
46	46	6	Systems of collection of wastes	Cos 6	
47	47	6	Conservancy and Water Carriage System	Cos 6	
48	48	6	Water Carriage	Cos 6	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			System – features, comparison, suitability		
49	49	6	Conservancy – features, comparison, suitability	Cos 6	
50	50	7	Quantity of sanitary sewage	Cos --Select--	
51	51	7	Domestic & industrial sewage	Cos --Select--	
52	52	7	Variation in sewage flow	Cos --Select--	
53	53	7	Numerical problem on computation quantity of sanitary sewage	Cos --Select--	
54	54	7	Computation of size of sewer	Cos --Select--	
55	55	7	Application of Chazy's formula, limiting velocities of flow: self-cleaning and scouring	Cos --Select--	
56	56	7	General importance, strength of sewage	Cos --Select--	
57	57	7	Characteristics of sewage-physical, chemical & biological	Cos --Select--	
58	58	7	Concept of sewage sampling	Cos --Select--	
59	59	7	tests for – solids, pH, dissolved oxygen, BOD, COD	Cos --Select--	
60	60	8	Types of system-separate, combined, partially separate, features	Cos --Select--	
61	61	8	Comparison between the types, suitability	Cos --Select--	
62	62	8	Shapes of sewer – rectangular, circular, avoid-features, suitability	Cos --Select--	
63	63	8	Laying of sewer-setting out sewer alignment	Cos --Select--	
64	64	9	Manholes and Lamp holes – types, features, location,	Cos --Select--	

L No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			function		
65	65	9	Inlets, Grease & oil trap – features, location, function	Cos --Select--	
66	66	9	Storm regulator, inverted siphon – features, location, function	Cos --Select--	
67	67	9	Disposal on land – sewage farming, sewage application, and dosing	Cos --Select--	
68	68	9	Sewage sickness causes and remedies	Cos --Select--	
69	69	9	Disposal by dilution – standards for disposal in different types of water bodies	Cos --Select--	
70	70	9	Self-purification of stream	Cos --Select--	
71	71	10	Principles of treatment, the flow diagram of conventional treatment	Cos --Select--	
72	72	10	Primary treatment – necessity, principles, essential features, functions	Cos --Select--	
73	73	10	Secondary treatment – necessity, principles, essential features, functions	Cos --Select--	
74	74	11	Requirements of building drainage, the layout of lavatory blocks in residential buildings, the layout of building drainage	Cos --Select--	
75	75	11	Plumbing arrangement of single storied & multi-storied buildings	Cos --Select--	

Subject Teacher

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