	CAPITAL SCHOOL OF ENGINEERING
PLOT NO. 1288, MAHATAPALLA, BAJAPUR, KHURDA,PIN-752060	
Session: 2023-2024	
Course Name: DIPLOMA	**Branch Name:** CIVIL
Subject Name: TH 1 : Structural	**Theory/Practical:** Theory
Section: A	**Teacher Name:** BISWARANJAN PRADHAN
Semester: 3	

Credit '' External Evaluation(Marked) '' Internal Evaluation(Marked) ''

Text Books:

Sl.No	Text Books
1	R.Subramanian Strength of Materials
2	S.Rammrutham, Theory of structure

Reference books:

Sl.No	Reference books
1	V.N.Vazirani & M.M. Rathwani, Analysis of Structures Vol.I

Course Outcomes:

Sl.No	Course Outcomes
1	Students are able to understand the behaviour of material under different loading
2	Student are able to understand and calculate the different type of stress like, simple stress, shear stress, direct stress and b
3	Students are students are able to understand and calculate the shear force and bending moment for beam of different loading
4	Students are able to calculate the deflection of beam for different loading

SL	Lectur	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	Basic Principle of Mechanics	Cos 1	
2	2	1	Force, Moment, support conditions, Conditions of equilibrium C.G & MI, Free body diagram	Cos 1	
3	3	1	Review of CG and MI of different sections	Cos 1	
4	4	2	Mechanical properties of materials â€“ Rigidity, Elasticity, Plasticity, Compressibility, Hardness, Toughness, Stiffness, Brittlen	Cos 1	
5	5	2	Types of stresses -Tensile, Compressive and Shear stresses	Cos 2	

6	6	2	Types of strains - Tensile, Compressive and Shear strains, Complimentary shear stress - Diagonal tensile / compressive Stresses	Cos 2	
7	7	2	Elongation and Contraction, Longitudinal and Lateral strains	Cos 2	
8	8	2	Poissonâ€™s Ratio, Volumetric strain, computation of stress, strain, Poissonâ€™s ratio	Cos 2	
9	9	2	change in dimensions and volume	Cos 2	
10	10	2	Hookeâ€™s law - Elastic Constants, Derivation of relationship between the elastic constants	Cos 2	
11	11	2	Behaviour of ductile and brittle materials under direct loads, Stress Strain curve of a ductile material,	Cos 1	
12	12	2	Limit of proportionality, Elastic limit, Yield stress, Ultimate stress, Breaking stress	Cos 1	
13	13	2	Percentage elongation, Percentage reduction in area	Cos 1	
14	14	2	Significance of percentage elongation and reduction in area of cross section	Cos 1	
15	15	2	Deformation of prismatic bars due to uniaxial load, Deformation of prismatic bars due to its self weight.	Cos 1	
16	16	2	Occurrence of normal and tangential stresses, Concept of Principal stress and Principal Planes	Cos 2	
17	17	2	major and minor principal stresses and their orientations	Cos 2	
18	18	2	Mohrâ€™s Circle and its application to solve problems of complex stresses	Cos 2	
19	19	3	Bending stress in beams â€“ Theory of simple bending â€“	Cos 2	
20	20	3	Assumptions â€“ Moment of resistance â€“ Equation for Flexure	Cos 2	
21	21	3	Flexural stress distribution â€“ Curvature of beam	Cos 2	
22	22	3	Flexural stress distribution â€“ Curvature of beam	Cos 2	
23	23	3	Position of N.A. and Centroidal Axis â€“ Flexural rigidity â€“ Significance of Section modulus	Cos 2	
24	24	3	Shear stress distribution in beams of rectangular	Cos 2	

25	25	3	circular and standard sections symmetrical about vertical axis.	Cos 2	
26	26	3	Concept of torsion, basic assumptions of pure torsion	Cos 2	
27	27	3	torsion of solid and hollow circular sections, polar moment of inertia	Cos 2	
28	28	3	torsional shearing stresses, angle of twist, torsional rigidity, equation of torsion	Cos 2	
29	29	3	Combination of stresses, Combined direct and bending stresses,	Cos 2	
30	30	3	Maximum and Minimum stresses in Sections, Conditions for no tension	Cos 2	
31	31	3	Limit of eccentricity, Middle third/fourth rule, Core or Kern for square,	Cos 2	
32	32	3	rectangular and circular sections, chimneys, dams and retaining walls	Cos 2	
33	33	4	Columns and Struts, Definition, Short and Long columns, End conditions	Cos 2	
34	34	4	Equivalent length / Effective length, Slenderness ratio, Axially loaded short and long column	Cos 2	
35	35	4	n, Eulerâ€™s theory of long columns	Cos 2	
36	36	4	Critical load for Columns with different end conditions	Cos 2	
37	37	5	Types of Loads: Concentrated (or) Point load, Uniformly Distributed load (UDL), Types of Supports: Simple support, Roller suppor	Cos 3	
38	38	5	Types of Reactions: Vertical reaction, Horizontal reaction, Moment reaction,	Cos 3	
39	39	5	Types of Beams based on support conditions: Calculation of support reactions using equations of static equilibrium	Cos 3	
40	40	5	Signs Convention for S.F. and B.M, S.F and B.M of general cases of determinate beams with concentrated loads and udl only	Cos 3	
41	41	5	S.F and B.M diagrams for Cantilevers, Simply supported beams and Over hanging beams,	Cos 3	
42	42	5	Position of maximum BM, Point of contra flexure	Cos 3	
43	43	5	Relation between intensity of load, S.F and B.M	Cos 3	

44	44	6	Shape and nature of elastic curve (deflection curve); Relationship between slope, deflection and curvature (No derivation)	Cos 4	
45	45	6	Importance of slope and deflection.	Cos 4	
46	46	6	Slope and deflection of cantilever and simply supported beams under concentrated and uniformly distributed load (by Double Inte	Cos 4	
47	47	7	Indeterminacy in beams, Principle of consistent deformation/compatibility,	Cos 4	
48	48	7	Analysis of propped cantilever, fixed and two span continuous beams by principle of superposition	Cos 4	
49	49	7	SF and BM diagrams (point load and udl covering full span)	Cos 4	
50	50	8	Types of trusses, statically determinate and indeterminate trusses	Cos 4	
51	51	8	degree of indeterminacy, stable and unstable trusses, advantages of trusses	Cos 4	
52	52	8	Analytical method (Method of joints, method of Section)	Cos 4	

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PLOT NO. 1288, MAHATAPALLA, BAJAPUR, KHURDA,PIN-752060	
Session: 2023-2024	
Course Name: DIPLOMA	**Branch Name:** CIVIL
Subject Name: TH 3 : Building materials & Construction	**Theory/Practical:** Theory
Section: A	**Teacher Name:** SUPRIYA PRADHAN
Semester: 3	

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

Text Books:

Sl.No	Text Books
1	Building materials & Construction by N. Subramanian
2	Engineering Materials by Rangwala
3	Building Construction by Rangwala
4	Construction Technology by Sarkar & Saraswati

Reference books:

Sl.No	Reference books

Course Outcomes:

Sl.No	Course Outcomes
1	Realize the role of rock, bricks, cement, concrete, timber and steel in construction and comprehend the classification and proce
2	Understand the composition and mechanism of the protective paints and prescribe as necessary.
3	Understand the composition and mechanism of the protective paints and prescribe as necessary.
4	Understand the glossary of terms involved in foundation, masonry, wood works and other activities involved in building construct
5	Grasp the construction details involved in a building.

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	Stone	uses of stone, natural bed of stone	Cos 1	
2	2	Stone	Qualities of good building stone,	Cos 1	
3	3	Stone	Dressing of stone	Cos 1	
4	4	Stone	different types of stone and their uses	Cos 1	
5	5	Bricks	Brick earth its composition	Cos 1	

6	6,7,8	Bricks	Preparation of brick earth, Moulding, Drying, Burning in kilns (continuous Process)	Cos 1	
7	9,10,11	Bricks	size of traditional and modular bricks, qualities of good	Cos 1	
8	12	Cement,mortar and concrete	cements, Properties of cements,	Cos 1	
9	13	Cement,mortar and concrete	application of blended cement with fly ash and blast furnace slag.	Cos 1	
10	14	Cement,mortar and concrete	Mortar: Definition and types of mortar	Cos 1	
11	15	Cement,mortar and concrete	classification of sand, Bulking of sand	Cos 1	
12	16	Cement,mortar and concrete	and fly ash as different building material	Cos 1	
13	17,18,19	Cement,mortar and concrete	and composition- Water cement ratio- Workability, mechanical properties	Cos 1	
14	20	Other construction Material	Timber: Classification and Structure of timber.	Cos 1	
15	21,22	Other construction Material	Seasoning of timber Importance	Cos 1	
16	23	Other construction Material	Characteristics of good timber	Cos 2	
17	24,25	Other construction Material	Clay products and refractory materials Definition and Classification.	Cos 2	
18	26,27,28	Other construction Material	refractory materials- tiles, terracotta, porcelain glazing.	Cos 2	
19	29,30	Other construction Material	cast iron, wrought iron, mild steel and tor steel	Cos 2	
20	31,32	Surface Protective Materials	Composition of Paints, enamels, varnishes.	Cos 2	
21	33,34,35	Surface Protective Materials	surface protective materials like Paints, Enamels, Varnishes, Distempers, Emulsion,	Cos 2	
22	36	Introduction	classification of buildings based on	Cos 2	
23	37	Introduction	Different components of a building.	Cos 2	

24	38,39	Introduction	Site investigation objectives, site reconnaissance and explorations.	Cos 2	
25	40	Foundations	Concept of foundation and its purpose	Cos 3	
26	41	Foundations	Types of foundations shallow and deep	Cos 3	
27	42,43	Foundations	constructional details of : Spread foundations for walls, thumb rules for depth and width of	Cos 3	
28	44	Foundations	foundations-their suitability, classification of piles based on materials,	Cos 3	
29	45	Walls & Masonry Work	Purpose of walls	Cos 3	
30	46	Walls & Masonry Work	Classification of walls load bearing, non-load bearing walls, retaining walls.	Cos 3	
31	47	Walls & Masonry Work	as per materials of construction: brick, stone, reinforced brick, reinforced concrete,	Cos 3	
32	48	Walls & Masonry Work	Suitability and uses of brick and wooden	Cos 3	
33	49	Walls & Masonry Work	Definition of different terms	Cos 3	
34	50	Walls & Masonry Work	Bond meaning and necessity: English bond for 1and 1-1/2 Brick thick walls. T, X and right angled corner junctions. Thickness f	Cos 3	
35	51	Walls & Masonry Work	Stone Masonry	Cos 3	
36	52	Walls & Masonry Work	Glossary of terms String course, corbel, cornice, block-in-course, grouting, mouldings, templates, throating, through stones, p	Cos 3	
37	53	Doors,Windows and Lintels	Glossary of terms used in doors and windows	Cos 4	
38	54	Doors,Windows and Lintels	Doors different types of doors	Cos 4	

39	55	Doors,Windows and Lintels	Windows different types of windows	Cos 4	
40	56	Doors,Windows and Lintels	Purpose of use of arches and lintels	Cos 4	
41	57	Floors ,Roofs and Stairs	Floors: Glossary of terms ,Types of floor finishes cast-in-situ, concrete flooring(monolithic, bonded), terrazzo tile flooring	Cos 5	
42	58	Floors ,Roofs and Stairs	terms, Types of roofs, concept and function of flat, pitched, hipped	Cos 5	
43	59	Floors ,Roofs and Stairs	terms; Stair case, winder, landing, stringer, newel, baluster, rise, tread,	Cos 5	
44	60	Floors ,Roofs and Stairs	Various types of stair case straight flight, dog legged, open well, quarter turn, half turn (newel and geometrical stairs), bi	Cos 5	

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Session: 2023-2024	
Course Name: DIPLOMA	**Branch Name:** CIVIL
Subject Name: TH 2 : Geotechnical	**Theory/Practical:** Theory
Section: A	**Teacher Name:** BIPASH MOHANTY
Semester: 3	

Credit '' External Evaluation(Marked) '' Internal Evaluation(Marked) ''

Text Books:

Sl.No	Text Books
1	Dr. B.C.Punmia ,Soil Mechanics & Foundation Engineering

Reference books:

Sl.No	Reference books
1	Dr. K.R.Arora Soil Mechanics& Foundation Engineering
2	Dr. V.N.S. Murthy Soil Mechanics& Foundation Engineering,Vol-I

Course Outcomes:

Sl.No	Course Outcomes
1	comprehend the scope of soil mechanics and define the associated terminology and inter-relation among various soil properties.
2	classify and indentify soil types under different standards
3	comprehend significance of permeability and seepage and compute those.
4	describe requirement and methodology of compaction and consolidation.
5	realize the methods towards shear strength estimation and obtain strength envelop for different types of soils.
6	define terms of foundation engineering and estimate bearing capacity.

SL	Lectu	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	Soil and Soil Engineering	Cos 1	
2	2	1	Scope of Soil Mechanics , Origin and formation of soil	Cos 1	
3	3	2	Soil as a three Phase system.	Cos 1	
4	4	2	Water Content, Density, Specific gravity	Cos 1	
5	5	2	Voids ratio, Porosity, Percentage of air voids	Cos 1	
6	6	2	air content, degree of saturation	Cos 1	
7	7	2	air content, degree of saturation	Cos 1	

8	8	2	density Index, Bulk/Saturated/dry/submerged density,	Cos 1	
9	9	2	Interrelationship of various soil parameters	Cos 1	
10	10	3	Water Content ,Specific Gravity	Cos 1	
11	11	3	Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses	Cos 1	
12	12	3	Consistency of Soils, Atterbergâ€™s Limits	Cos 1	
13	13	3	Plasticity Index, Consistency Index, Liquidity Index	Cos 1	
14	14	4	Classification of Soil	Cos 2	
15	15	4	Classification of Soil, general	Cos 2	
16	16	4	I.S. Classification	Cos 2	
17	17	4	Plasticity chart	Cos 2	
18	18	5	Concept of Permeability, Darcyâ€™s Law, Co-efficient of Permeability	Cos 3	
19	19	5	Factors affecting Permeability.	Cos 3	
20	20	5	Constant head permeability and falling head permeability Test.	Cos 3	
21	21	5	Seepage pressure, effective stress	Cos 3	
22	22	5	phenomenon of quick sand	Cos 3	
23	23	6	Compaction, Light and heavy compaction Test	Cos 4	
24	24	6	Optimum Moisture Content of Soil, Maximum dry density, Zero air void line	Cos 4	
25	25	6	Factors affecting Compaction, Field compaction methods and their suitability	Cos 4	
26	26	6	Consolidation, distinction between compaction and consolidation.	Cos 4	
27	27	6	Terzaghiâ€˜s model analogy of compression/ springs showing the process of consolidation â€“ field implications	Cos 4	
28	28	6	Terzaghiâ€˜s model analogy of compression/ springs showing the process of consolidation â€“ field implications	Cos 4	
29	29	7	Concept of shear strength, Mohr- Coulomb failure theory	Cos 5	

30	30	7	Cohesion, Angle of internal friction, strength envelope for different type of soil	Cos 5	
31	31	7	Measurement of shear strength;- Direct shear test	Cos 5	
32	32	7	triaxial shear test	Cos 5	
33	33	7	unconfined compression test and vane-shear test	Cos 5	
34	34	8	Active earth pressure	Cos 5	
35	35	8	Passive earth pressure,	Cos 5	
36	36	8	Earth pressure at rest.	Cos 5	
37	37	8	Use of Rankineâ€™s formula for the following cases (cohesion-less soil only)	Cos 5	
38	38	8	(i) Backfill with no surcharge,	Cos 5	
39	39	8	(i) Backfill with no surcharge,	Cos 5	
40	40	9	Functions of foundations, shallow and deep foundation	Cos 6	
41	41	9	different type of shallow and deep foundations with sketches	Cos 6	
42	42	9	Types of failure (General shear, Local shear & punching shear)	Cos 6	
43	43	9	Types of failure (General shear, Local shear & punching shear)	Cos 6	
44	44	9	Bearing capacity of soil, bearing capacity of soils using Terzaghiâ€™s formulae	Cos 6	
45	45	9	IS Code formulae for strip, Circular and square footings	Cos 6	
46	46	9	Effect water table on bearing capacity of soil	Cos 6	
47	47	9	Plate load test	Cos 6	
48	48	9	standard penetration test	Cos 6	

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Session: 2023-2024	
Course Name: DIPLOMA	**Branch Name:** CIVIL
Subject Name: TH 4 : Estimation &Cost	**Theory/Practical:** Theory
Section: A	**Teacher Name:** ANURADHA PANDA
Semester: 3	

Credit '' External Evaluation(Marked) '' Internal Evaluation(Marked) ''

Text Books:

Sl.No	Text Books
1	Estimating, Costing, specification &Valuation in Civil Engineering, M.Chakraborty
2	Estimating & Costing, B.N.Dutta
3	Accounts & contracts, A. Panigrahi

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	Students will be able to learn about the types of estimation
2	Students will be able to solve numericals of estimation by using different methods
3	Students will be able to estimate the Rate Analysis for different work
4	Students will be able to learn about the Administrative set-up and hierarchy of Engineering department in State Govt./Central Go

SL No.	Lecture	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	Types of estimates â€“ Plinth area, floor area/carpet area	Cos 1	
2	2	1	Units and modes of measurements as per IS 1200	Cos 1	
3	3	1	Accuracy of measurement for different items of work	Cos 1	
4	4	1	REVISION	Cos 1	
5	5	2	Numericals on Short wall long wall method	Cos 2	
6	6	2	Numericals on Short wall long wall method	Cos 2	

7	7	2	Numericals on Short wall long wall method	Cos 2	
8	8	2	Numericals on Centreline method	Cos 2	
9	9	2	Numericals on Centreline method	Cos 2	
10	10	2	Numericals on Centreline method	Cos 2	
11	11	2	deductions in masonry	Cos 2	
12	12	2	plastering, whitewashing, painting	Cos 2	
13	13	2	multiplying factor (paint coefficients) for the painting of doors and windows	Cos 2	
14	14	2	Detailed estimate of single-storied flat roof building	Cos 2	
15	15	2	RCC roof slab with leakproof treatment over it including staircase and musty room	Cos 2	
16	16	2	REVISION	Cos 2	
17	17	3	Analysis of rates for cement concrete	Cos 3	
18	18	3	Analysis of rates for brick masonry	Cos 3	
19	19	3	Analysis of rates for stone masonry	Cos 3	
20	20	3	Analysis of rates for cement mortar	Cos 3	
21	21	3	Analysis of rates for cement plaster	Cos 3	
22	22	3	Analysis of rates for white washing	Cos 3	
23	23	3	Analysis of rates for painting	Cos 3	
24	24	3	Rate Analysis for Artificial Stone flooring	Cos 3	
25	25	3	R.A for Tile flooring	Cos 3	
26	26	3	R.A for concrete flooring	Cos 3	
27	27	3	R.C.C. with centering and shuttering	Cos 3	
28	28	3	R.A for reinforcing steel	Cos 3	
29	29	3	R.A. for Painting of doors and windows	Cos 3	
30	30	3	Calculation of lead, lift, conveyance charges, royalty of materials	Cos 3	
31	31	3	Abstract of cost of the estimate	Cos 3	
32	32	3	Valuation- Value and cost, scrap value, salvage value, assessed value	Cos 3	
33	33	3	Sinking fund, depreciation and obsolesce, methods of valuation	Cos 3	
34	34	3	Numericals	Cos 3	
35	35	3	REVISION	Cos 3	
36	36	4	Administrative set-up and hierarchy of Engineering department in State Govt.	Cos 4	
37	37	4	Administrative set-up and hierarchy of Engineering department in Central Govt.	Cos 4	
38	38	4	Administrative set-up and hierarchy of Engineering department in PSUs.	Cos 4	

39	39	4	Administrative set-up and hierarchy of Engineering department in Private Sector	Cos 4	
40	40	4	Duties and responsibilities of Engineers at different positions /levels	Cos 4	
41	41	4	REVISION	Cos 4	
42	42	4	CLASS TEST	Cos 4	

Aparadha Pande

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