

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 Design - I	Theory/Practical: Theory
Section: A	Teacher Name: SAILASHREE PRIYADARSANI
Semester: 4	

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

Text Books:

Sl.No	Text Books
1	Design of Reinforced Concrete Structures by N.Subramanian
2	Fundamentals of Reinforced Concrete by N.C.Sinha, S.K.Roy. S.Chand
3	Reinforced Concrete by H.J Saha. Charotar Publishing house
4	Reinforced Concrete Structures by Pillai & Menon. Tata McGraw Hill Education Private Limited
5	Limit State Method (RCC Design) by A.K. Jain. Nem Chand & Bros

Reference books:

Sl.No	Reference books
1	IS:456-2000 BIS Publication
2	SP-16 BIS Publication

Course Outcomes:

Sl.No	Course Outcomes
1	Comprehend design philosophies and compare those
2	Refer the design codes
3	Design simple R.C. structural elements
4	Draw structural details for construction
5	Analyze and design structural elements such as beams, columns, staircase etc
6	Design formwork and scaffolding

Sl	Lect	Module/Unit No.	Topic To Be Taught	Cos	Reference Material
1	1	Working stress method (WSM)	State the different methods of design of concrete structures. R.C. sections their behavior, grades of concrete and steel. Permis	Cos 1	
2	2	Working stress method (WSM)	Flexural design and analysis of single reinforced sections from first principles	Cos 1	




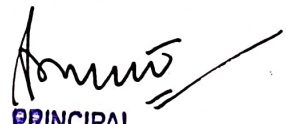
3	3,4	Working stress method (WSM)	Concept of under reinforced, over reinforced and balanced sections.	Cos 1	
4	5	Working stress method (WSM)	Advantages and disadvantages of WSM, reasons for its obsolescence	Cos 2	
5	6	Philosophy Of Limit State Method (LSM)	Definition, Advantages of LSM over WSM, IS code suggestions regarding design philosophy.	Cos 2	
6	7	Philosophy Of Limit State Method (LSM)	Types of limit states, partial safety factors for materials strength, characteristic strength, characteristic load, design load,	Cos 2	
7	8	Philosophy Of Limit State Method (LSM)	Study of I.S specification	Cos 2	
8	9,10	Analysis and Design of Single and Double Reinforced Sections	Limit state of collapse (flexure), Stress-Strain relationship for concrete and steel, stress block diagram and strain diagram.	Cos 3	
9	11,12,13	Analysis and Design of Single and Double Reinforced Sections	Concept of under- reinforced, over-reinforced and limiting section, neutral axis co-efficient.	Cos 3	
10	14-20	Analysis and Design of Single and Double Reinforced Sections	Analysis and design: determination of design constants, moment of resistance and area of steel for rectangular sections	Cos 3	
11	21-24	Analysis and Design of Single and Double Reinforced Sections	design of doubly reinforced rectangular section	Cos 3	
12	25	Shear, Bond and Development Length (LSM)	Nominal shear stress in R.C. section, design shear strength of concrete, Nominal shear stress in R.C. section, design shear stre	Cos 3	
13	26	Shear, Bond and Development Length (LSM)	Bond and types of bond, bond stress, check for bond stress, development length in tension and compression	Cos 3	
14	27	Shear, Bond and Development Length (LSM)	Design of shear reinforcement; Minimum shear reinforcement in beams	Cos 3	
15	28	Analysis and Design of T-Beam (LSM)	General features, advantages, effective width of flange	Cos 4	
16	29-35	Analysis and Design of T-Beam (LSM)	Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis	Cos 4	
17	36-39	Analysis and Design of T-Beam (LSM)	Simple numerical problems on deciding effective flange width.	Cos 4	
18	40-44	Analysis and Design of Slab and Stair case (LSM)	Design of simply supported one-way slabs for flexure check for deflection control and shear.	Cos 4	

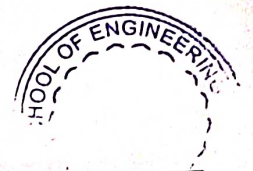


19	45-50	Analysis and Design of Slab and Stair case (LSM)	Design of one-way cantilever slabs and cantilevers chajjas for flexure.	Cos 5	
20	51,5-2	Analysis and Design of Slab and Stair case (LSM)	Design of two-way simply supported slabs for flexure.	Cos 5	
21	53,5-4	Analysis and Design of Slab and Stair case (LSM)	Design of dog-legged staircase	Cos 5	
22	55,5-6	Analysis and Design of Slab and Stair case (LSM)	Detailing of reinforcement in stairs spanning longitudinally	Cos 5	
23	57	Design of Axially loaded columns and Footings (LSM)	Assumptions in limit state of collapse-compression.	Cos 5	
24	58	Design of Axially loaded columns and Footings (LSM)	Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum re	Cos 5	
25	59-61	Design of Axially loaded columns and Footings (LSM)	Analysis and design of axially loaded short square, rectangular and circular columns (with lateral ties only).	Cos 5	
26	61-65	Design of Axially loaded columns and Footings (LSM)	Types of footing, Design of isolated square column footing of uniform thickness for flexure and shear.	Cos 5	

Sailashree Prasadarani


HOD (CE)
CAPITAL SCHOOL OF ENGINEERING
KHORDHA, BHUBANESHWAR


PRINCIPAL
CAPITAL SCHOOL OF ENGINEERING
KHORDHA-751030



CAPITAL SCHOOL OF ENGINEERING

PLOT NO. 1288, MAHATAPALLA, BAJAPUR, KHURDA, PIN-752060

Session: 2023-2024

Course Name: DIPLOMA	Branch Name: CIVIL
Subject Name: Th.4: Highway	Theory/Practical: Theory
Section: A	Teacher Name: BISWARANJAN PRADHAN
Semester: 4	

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

Text Books:

Sl.No	Text Books
1	S.K.Khanna & C.E.G. Justo Highway Engineering

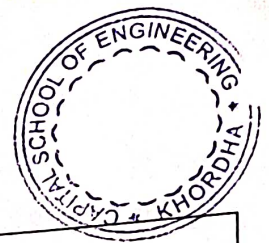
Reference books:

Sl.No	Reference books
1	S.P.Chandola A Text Book Of Transportation Engineering S. Chand
2	S.P.Bindra A course on Highway engineering

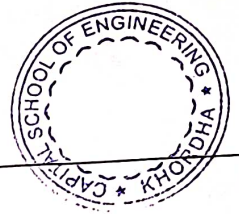
Course Outcomes:

Sl.No	Course Outcomes
1	Realize significance of the highway transportation and professional bodies associated
2	Acquaint themselves with road geometric terms and understand the purpose of providing necessary features including angles and cu
3	Select proper road construction materials based on required properties and test data.
4	Comprehend the pavements and their types and know the step wise construction processes
5	Acquire knowledge on common construction equipment
6	Realize essence of drainage and maintenance on the highways and prescribe related practices.

SL No.	Lect	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Centra	Cos 1	
2	2	1	Functions of Indian Roads Congress	Cos 1	
3	3	1	IRC classification of roads	Cos 1	
4	4	1	Organisation of state highway department	Cos 1	
5	5	2	Glossary of terms used in geometric and their importance	Cos 2	



6	6	2	right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient	Cos 2	
7	7	2	Design and average running speed, stopping and passing sight distance	Cos 2	
8	8	2	Necessity of curves, horizontal and vertical curves including transition curves	Cos 2	
9	9	2	super elevation, Methods of providing super elevation	Cos 2	
10	10	3	Difference types of road materials in use: soil, aggregates, and binders	Cos 3	
11	11	3	Function of soil as highway Subgrade 3.3 California Bearing Ratio: methods of finding	Cos 3	
12	12	3	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance	Cos 3	
13	13	3	Testing aggregates: Abrasion test, impact test, crushing strength test	Cos 3	
14	14	3	water absorption test & soundness test	Cos 3	
15	15	4	Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components	Cos 4	
16	16	4	Setting out alignment of road, setting out bench marks	Cos 4	
17	17	4	control pegs for embankment and cutting, borrow pits, making profile of embankment	Cos 4	
18	18	4	construction of embankment, compaction, stabilization	Cos 4	
19	19	4	preparation of subgrade, methods of checking camber	Cos 4	
20	20	4	gradient and alignment as per recommendations of IRC	Cos 4	
21	21	4	equipment used for subgrade preparation	Cos 5	
22	22	4	Necessity of sub base, stabilized sub base, purpose of stabilization (no designs)	Cos 5	
23	23	4	Mechanical stabilization i, Lime stabilization	Cos 5	
24	24	4	Cement stabilization i, Fly ash stabilization	Cos 5	
25	25	4			



26	26	4	Preparation of base course, Brick soling, stone soling and metalling	Cos 5
27	27	4	Water Bound Macadam and wet-mix Macadam, Bituminous	Cos 5
28	28	4	Surface dressing (i) Premix carpet and (ii) Semi dense carpet	Cos 5
29	29	4	Bituminous concrete ,Grouting	Cos 5
30	30	4	Concept of concrete roads as per IRC specifications	Cos 5
31	31	5	Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling	Cos 5
32	32	5	Breast Walls, Retaining walls, different types of bends	Cos 5
33	33	6	Necessity of road drainage work, cross drainage works	Cos 6
34	34	6	Surface and sub-surface drains and storm water drains. Location,	Cos 6
35	35	6	spacing and typical details of side drains, side ditches for surface drainage	Cos 6
36	36	6	intercepting drains, pipe drains in hill roads,	Cos 6
37	37	6	details of drains in cutting embankment, typical cross sections	Cos 6
38	38	7	Common types of road failures " their causes and remedies	Cos 6
39	39	7	Maintenance of bituminous road such as patch work and resurfacing	Cos 6
40	40	7	Maintenance of concrete roads " filling cracks, repairing joints, maintenance	Cos 6
41	41	7	maintenance of traffic control devices	Cos 6
42	42	7	Basic concept of traffic study, Traffic safety and traffic control signal	Cos 6
43	43	8	Hot mixing plant	Cos 5
44	44	8	Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline	Cos 5
45	45	8	Asphalt mixer and tar boilers	Cos 5
46	46	8	Road pavers	Cos 5
47	47	8	Modern construction equipments for roads	Cos 5

R.M.

[Signature]
 HOD (CE)
 CAPITAL SCHOOL OF ENGINEERING
 KHORDHA, BHUBANESWAR

[Signature]
 PRINCIPAL
 CAPITAL SCHOOL OF ENGINEERING

CAPITAL SCHOOL OF ENGINEERING

PLOT NO. 1288, MAHATAPALLA, BAJAPUR, KHURDHA, PIN-752060

Session: 2023-2024

Course Name: DIPLOMA

Branch Name: CIVIL

Subject Name: Th.3: Land Surveying I

Theory/Practical: Theory

Section: A

Teacher Name: SUPRIYA PRADHAN

Semester: 4

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

Text Books:

Sl.No	Text Books
1	Surveying and Levelling By R.Subramanian
2	Surveying, Vol.-I&II by Dr.B.C.Punmia.
3	Surveying & Levelling by N.N Basak.
4	A text Book of Surveying & Levelling by R. Agor

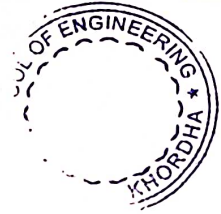
Reference books:

Sl.No	Reference books
-------	-----------------

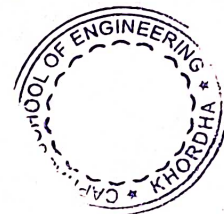
Course Outcomes:

Sl.No	Course Outcomes
1	Define various survey terminology and carryout necessary corrections for errors
2	Comprehend the principle, purpose, equipment and error corrections in chain and compass surveying
3	Comprehend the principle, purpose, equipment and error corrections in plane table and theodolite surveying
4	Comprehend the map nomenclature and apply skills in map interpretation
5	Compute area and volume using different numerical algebraic methods
6	compute the reciprocal levelling

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	SURVEYING, LINEAR MEASUREMENTS	Surveying: Definition, Aims and objectives	Cos 1	
2	2,3	INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS	Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying.	Cos 1	
3	4,5	INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS	Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains.	Cos 1	
4	5,6	INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS	Errors and mistakes in linear measurement classification, Sources of errors and remedies.	Cos 1	



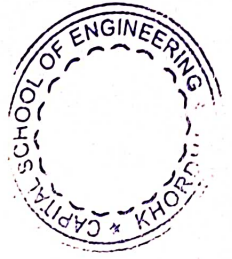
5	7,8	INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS	due to-incorrect length, temperature variation, pull, sag, numerical problem applying correction	Cos 1	
6	9,10	CHAINING AND CHAIN SURVEYING	Ranging Purpose, signaling, direct and indirect ranging, Line ranger " features and use, error due to incorrect ranging.	Cos 1	
7	11,12,13	CHAINING AND CHAIN SURVEYING	"Chaining on flat ground, Chaining on sloping ground " stepping method, Clinometer-features and use, slope c	Cos 1	
8	14,15	CHAINING AND CHAIN SURVEYING	Setting perpendicular with chain & tape, Chaining across different types of obstacles Numerical problems on chaining across obs.	Cos 1	
9	16	CHAINING AND CHAIN SURVEYING	Purpose of chain surveying, Its Principles, concept of field book.	Cos 1	
10	17	CHAINING AND CHAIN SURVEYING	Selection of survey stations, base line, tie lines, Check lines.	Cos 1	
11	18,19	CHAINING AND CHAIN SURVEYING	Perpendicular and Oblique offsets, Instruments for setting offset Cross Staff, Optical Square.	Cos 1	
12	20,21,22	CHAINING AND CHAIN SURVEYING	Errors in chain surveying compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveyi	Cos 1	
13	23	MEASUREMENT AND COMPAS SURVEYING	Measurement of angles with chain, tape & compass	Cos 2	
14	24,25	ANGULAR MEASUREMENT AND COMPAS SURVEYING	Compass Types, features, parts, merits & demerits, testing & adjustment of compass	Cos 2	
15	26,27,28	ANGULAR MEASUREMENT AND COMPAS SURVEYING	Designation of angles- concept of meridians Magnetic, True, arbitrary; Concept of bearings Whole circle bearing, Quadrantal	Cos 2	
16	29,30	ANGULAR MEASUREMENT AND COMPAS SURVEYING	centering, leveling, taking readings, concepts of Fore bearing, Back Bearing, Numerical prob	Cos 2	
17	31,32	ANGULAR MEASUREMENT AND COMPAS SURVEYING	of needle, magnetic declination, variation in declination, numerical problems on application	Cos 2	
18	33	MEASUREMENT AND COMPAS SURVEYING	with compass " sources & remedies.	Cos 2	



19	34	MEASUREMENT AND COMPAS SURVEYING	& closed traverse, Methods of traversing.	Cos 2	
20	35	MAP READING CADASTRAL MAPS & NOMENCLATURE	Reference and Grid Square, Study of Signs and Symbols.	Cos 3	
21	36	CADASTRAL MAPS & NOMENCLATURE	Cadastral Map Preparation Methodology	Cos 3	
22	37	CADASTRAL MAPS & NOMENCLATURE	Unique identification number of parcel	Cos 3	
23	38	CADASTRAL MAPS & NOMENCLATURE	Positions of existing Control Points and its types	Cos 3	
24	39	CADASTRAL MAPS & NOMENCLATURE	Features, Topology Creation and verification.	Cos 3	
25	40	CLASS TEST-1 PLANE TABLE SURVEYING	CLASS TEST-1 Objectives, principles and use of plane table surveying.	Cos 3	
26	41	PLANE TABLE SURVEYING	Instruments & accessories used in plane table surveying.	Cos 4	
27	42	PLANE TABLE SURVEYING	surveying (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection.	Cos 4	
28	43	PLANE TABLE SURVEYING	Statements of two points and three point problem.	Cos 4	
29	44	PLANE TABLE SURVEYING	and their corrections, precautions in plane table surveying.	Cos 4	
30	45	PLANE TABLE SURVEYING		Cos 4	
31	46	CLASS TEST-2 SURVEYING AND TRAVERSING	CLASS TEST-2 Purpose and definition of theodolite surveying	Cos 5	
32	47	THEODOLITE SURVEYING AND TRAVERSING	of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a ve	Cos 5	
33	48	SURVEYING AND TRAVERSING	Measurement of horizontal and vertical angles.	Cos 5	
34	49	THEODOLITE SURVEYING AND TRAVERSING	bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite	Cos 5	
35	50,51	THEODOLITE SURVEYING AND TRAVERSING	Methods of theodolite traversing with inclined angle method, deflection angle method, bearing method, Plotting the traverse by consecutive coordinates, latitude and departure, Gale™s traverse table, Numerical problems on omitted mea	Cos 5	
36	52,53,54	THEODOLITE SURVEYING AND TRAVERSING		Cos 5	
37	55,56	THEODOLITE SURVEYING AND TRAVERSING		Cos 5	



38	57	THEODOLITE SURVEYING AND TRAVERSING	Closing error adjustment of angular errors, adjustment of bearings, numerical problems	Cos 5	
39	58	CLASS TEST-3	CLASS TEST-3	Cos 5	
40	59	LEVELLING AND CONTOURING	types of leveling concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M	Cos 6	
41	60,61	LEVELLING AND CONTOURING	concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.	Cos 6	
42	62,63	LEVELLING AND CONTOURING	Levelling staff Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.	Cos 6	
43	64,65	LEVELLING AND CONTOURING	height of collimation method and Rise & Fall method, comparison, Numerical problems on reduction	Cos 6	
44	66	LEVELLING AND CONTOURING	Effects of curvature and refraction, numerical problems on application of correction.	Cos 6	
45	67	LEVELLING AND CONTOURING	Reciprocal leveling principles, methods, numerical problems, precise leveling.	Cos 6	
46	68	LEVELLING AND CONTOURING	precautions, Permanent and temporary adjustments of different types of levels.	Cos 6	
47	69	LEVELLING AND CONTOURING	Definitions, concepts and characteristics of contours.	Cos 6	
48	70	LEVELLING AND CONTOURING	Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets.	Cos 6	
49	71	LEVELLING AND CONTOURING	engineering projects drawing cross-sections from contour maps, locating proposal routes of roads	Cos 6	
50	72	LEVELLING AND CONTOURING	Human and Economic Activities (i.e.: Settlement, Communication, Land use etc.), Interpret Physical	Cos 6	
51	73	COMPUTATION OF AREA & VOLUME:	Determination of areas, computation of areas from plans.	Cos 6	
52	74	COMPUTATION OF AREA & VOLUME:	Calculation of area by using ordinate rule, trapezoidal rule, Simpsons TM s rule	Cos 6	



53	75	COMPUTATION OF AREA & VOLUME:	prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.	Cos 6	
----	----	-------------------------------	---	-------	--

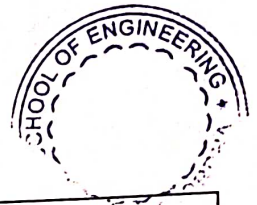
Supriya

[Signature]

HOD (CE)
CAPITAL SCHOOL OF ENGINEERING

[Signature]

PRINCIPAL
CAPITAL SCHOOL OF ENGINEERING
KHORDHA-751004



CAPITAL SCHOOL OF ENGINEERING

PLOT NO. 1288, MAHATAPALLA, BAJAPUR, KHURDA, PIN-752060

Session: 2023-2024

Course Name: DIPLOMA

Branch Name: CIVIL

Subject Name: Th.2: Hydraulic and Irrigation

Theory/Practical: Theory

Section: A

Teacher Name: ANURADHA PANDA

Semester: 4

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

Text Books:

Sl.No	Text Books
1	Fluid Mechanics & Hydraulic machines- Modi & Seth
2	Hydraulics & Fluid Mechanics- D.R. Biswal
3	A Text Book of Fluid Mechanics & Hydraulic machines- R.K.Rajput
4	Irrigation Engineering & Hydraulics Structures- S.K.Garg
5	Irrigation Engineering- N. N. Basak
6	Irrigation Engineering & Hydraulic structures- S.K. Sharma

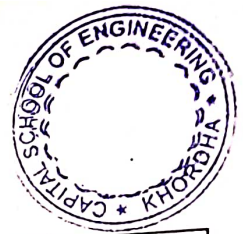
Reference books:

Sl.No	Reference books
1	A Text Book of Fluid Mechanics & Hydraulic machines- R.K.Rajput
2	Irrigation Engineering- N. N. Basak

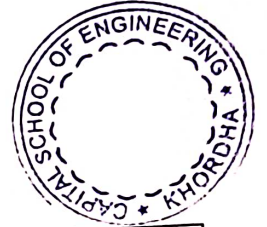
Course Outcomes:

Sl.No	Course Outcomes
1	Define common fluid properties and interpret results from pressure measuring instruments
2	Realize the science behind fluid flow and compute fluid flow characteristics through notches, weirs, channels and pipes
3	Realize the working principle of hydraulic pumps and evaluate their performance in general cases
4	Comprehend the need of irrigation
5	Determine cause and effect of water logging
6	Comprehend the purpose of irrigation system components and elaborate on these

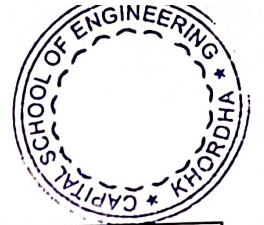
SL	Lecture	Module/Unit No.	Topic To Be Taught	Cos	Reference Material
1	1	1	Properties of fluid: density, specific gravity, surface tension	Cos 1	
2	2	1	capillarity, viscosity and their uses	Cos 1	
3	3	1	intensity of pressure	Cos 1	
4	4	1	atmospheric pressure	Cos 1	
5	5	1	gauge pressure, absolute pressure	Cos 1	



6	6	1	vacuum pressure	Cos 1	
7	7	1	relationship between atmospheric pressure, absolute pressure and gauge pressure	Cos 1	
8	8	1	pressure head, pressure gauges	Cos 1	
9	9	1	Total pressure, resultant pressure	Cos 1	
10	10	1	expression for total pressure exerted on horizontal surface	Cos 1	
11	11	1	expression for total pressure exerted on vertical surface	Cos 1	
12	12	2	Rate of discharge	Cos 2	
13	13	2	equation of continuity of liquid flow	Cos 2	
14	14	2	total energy of a liquid in motion- potential	Cos 2	
15	15	2	kinetic & pressure	Cos 2	
16	16	2	Bernoulli's theorem and its limitations	Cos 2	
17	17	2	Practical applications of Bernoulli's equation	Cos 2	
18	18	2	Notches, Weirs, types of notches and weirs	Cos 2	
19	19	2	Discharge through different types of notches and their application	Cos 2	
20	20	2	Discharge through different types of notches weirs and their application	Cos 2	
21	21	2	uniform and non uniform flow	Cos 2	
22	22	2	laminar and turbulent flow	Cos 2	
23	23	2	steady and unsteady flow	Cos 2	
24	24	2	Reynold's number and its application	Cos 2	
25	25	2	Different types of major and minor losses	Cos 2	
26	26	2	Simple numerical problems on losses due to friction using Darcy's equation	Cos 2	
27	27	2	Total energy lines & hydraulic gradient lines	Cos 2	
28	28	3	Types of channel sections-rectangular, trapezoidal section	Cos 3	
29	29	3	Types of channel sections circular, discharge formulae- Chezy's and Manning's equation	Cos 3	
30	30	3	Centrifugal Pump: basic principles, Operation	Cos 3	
31	31	3	Centrifugal Pump: Discharge, horse power & efficiency.	Cos 3	
32	32	3	Reciprocating Pump: Types, operation	Cos 3	



33	33	3	Reciprocating Pump: discharge, horse power & efficiency	Cos 3
34	34	1	Hydrology Cycle	Cos 4
35	35	1	Rainfall: types, intensity, hyetograph	Cos 4
36	36	2	Estimation of rainfall, rain gauges, Its types	Cos 4
37	37	2	Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae	Cos 4
38	38	2	Definition of irrigation, necessity, benefits of irrigation, types of irrigation	Cos 4
39	39	2	Crop season	Cos 4
40	40	2	Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops	Cos 4
41	41	2	Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio	Cos 4
42	42	3	Canal irrigation, types of canals	Cos 4
43	43	3	loss of water in canals	Cos 4
44	44	3	Perennial irrigation	Cos 4
45	45	3	Different components of irrigation canals and their functions	Cos 4
46	46	3	Sketches of different canal cross-sections	Cos 4
47	47	3	Classification of canals according to their alignment	Cos 4
48	48	3	Various types of canal lining " Advantages and disadvantages	Cos 4
49	49	4	Causes and effects of water logging	Cos 5
50	50	4	detection, prevention and remedies of water logging	Cos 5
51	51	5	Necessity of diversion head works	Cos 5
52	52	5	Objectives of diversion head works	Cos 5
53	53	5	weirs and barrages	Cos 5
54	54	5	General layout	Cos 5
55	55	5	functions of different parts of barrage	Cos 5
56	56	6	Silting and Scouring	Cos 5
57	57	6	Functions of regulatory structures	Cos 5
58	58	6	Introduction to cross drainage works	Cos 5
59	59	6	Functions and necessity of Cross drainage works	Cos 5
60	60	6	Functions and necessity of aqueducts	Cos 5
61	61	6	Functions and necessity of siphon	Cos 5
62	62	6	Functions and necessity of super passage	Cos 5



63	63	6	Functions and necessity of level crossing	Cos 5	
64	64	7	Necessity of storage reservoirs,	Cos 6	
65	65	7	types of dams	Cos 6	
66	66	7	Earthen dams: types, description	Cos 6	
67	67	7	causes of failure and protection measures	Cos 6	
68	68	7	Gravity dam- types, description	Cos 6	
69	69	7	Causes of failure and protection measures	Cos 6	
70	70	7	Spillways- Types (With Sketch) and necessity	Cos 6	

Anuragha Paide

HOD (CE)
CAPITAL SCHOOL OF ENGINEERING
KHORDHA, BHUBANESHWAR

PRINCIPAL
CAPITAL SCHOOL OF ENGINEERING