



GOVERNMENT POLYTECHNIC, KORAPUT DEPARTMENT CIVIL ENGINEERING

Discipline: CIVIL ENGG	Semester: 3rd	Name of the Teaching Faculty: RABINARAYAN HOTA, PTGF
Subject: STRUCTURAL MECHANICS	No. of days/perweek class allotted: 05	Semester From date: 15.09.2022 To Date: 22.12.2022 No. of Weeks: 13
PRE-REQUISITE	Basic knowledge about Engineering mechanics & som	
COURSE OUTCOMES	CO1: Analyze solid states under uniaxial loading and plane stress conditions. CO2: compression members and simple beams CO3: Draw shear force and bending moment diagrams of simple statically determinate beam CO4: Obtain slope and deflection profiles of statically determinate simple structural members. CO5: Compute forces in members of a truss	
Week	Class Day	Theory / Practical Topics
1 ST	1 ST	Review Of Basic Concepts; Basic Principle of Mechanics: Force, Moment, support conditions, Conditions of equilibrium, C.G & MI, Free body diagram
	2 ND	Review of CG and MI of different sections
	3 RD	Simple And Complex Stress, Strain
	4 TH	Simple Stresses and Strains
	5 TH	Introduction to stresses and strains: Mechanical properties of materials
2 ND	1 ST	Rigidity, Elasticity, Plasticity, Compressibility, Hardness, Toughness, Stiffness, Brittleness, Ductility, Malleability, Creep, Fatigue, Tenacity, Durability, Types of stresses -Tensile,
	2 ND	Compressive and Shear stresses, Types of strains - Tensile, Compressive and Shear strains, Complimentary shear stress - Diagonal tensile / compressive Stresses due to shear, Elongation and Contraction
	3 RD	Longitudinal and Lateral strains, Poisson's Ratio, Volumetric strain, computation of stress, strain, Poisson's ratio, change in dimensions and volume etc, Hooke's law - Elastic Constants, Derivation of relationship between the elastic constants.
	4 TH	Application of simple stress and strain in engineering field:
	5 TH	Behavior of ductile and brittle materials under direct loads
3 RD	1 ST	Stress Strain curve of a ductile material, Limit of proportionality, Elastic limit, Yield stress, Ultimate stress, Breaking stress,
	2 ND	Percentage elongation, Percentage reduction in area,
	3 RD	Significance of percentage elongation and reduction in area of cross section,
	4 TH	Revision of concepts
	5 TH	Deformation of prismatic bars due to uniaxial load, Deformation of prismatic bars due to its self weight.
4 TH	1 ST	Complex stress and strain

	2 ND	Principal stresses and strains: Occurrence of normal and tangential stresses,
	3 RD	Concept of Principal stress and Principal Planes,
	4 TH	major and minor principal stresses and their orientations,
	5 TH	Mohr's Circle and its application to solve problems of complex stresses
	1 ST	Stresses In Beams and Shafts
5 TH	2 ND	Stresses in beams due to bending: Bending stress in beams – Theory of simple bending – Assumption
	3 RD	Moment of resistance – Equation for Flexure– Flexural stress distribution – Curvature of beam
	4 TH	Position of N.A. and Centroidal Axis – Flexural rigidity – Significance of Section modulus
	5 TH	Shear stresses in beams: Shear stress distribution in beams of rectangular, circular and standard sections symmetrical about vertical axis.
	1 ST	QUIZ
6 TH	2 ND	Stresses in shafts due to torsion: Concept of torsion, basic assumptions of pure torsion,
	3 RD	torsion of solid and hollow circular sections, polar moment of inertia, torsional shearing stresses,
	4 TH	Revision of concepts
	5 TH	Angle of twist, torsional rigidity, equation of torsion
	1 ST	Combined bending and direct stresses: Combination of stresses, Combined direct and bending stresses,
7 TH	2 ND	Maximum and Minimum stresses in Sections, Conditions for no tension, Limit of eccentricity,
	3 RD	Revision of concepts
	4 TH	Middle third/fourth rule, Core or Kern for square, rectangular and circular sections, chimneys, dams and retaining walls
	5 TH	QUIZ
	1 ST	Columns and Struts
8 TH	2 ND	Columns and Struts, Definition, Short and Long columns,
	3 RD	End conditions, Equivalent length / Effective length,
	4 TH	Slenderness ratio, Axially loaded short and long column,
	5 TH	Euler's theory of long columns, Critical load for Columns with different end conditions
	1 ST	Shear Force and Bending Moment
9 TH	2 ND	Types of loads and beams:
	3 RD	Types of Loads: Concentrated (or) Point load,
	4 TH	Uniformly Distributed load (UDL), Types of Supports: Simple support,
	5 TH	Roller support, Hinged support, Fixed support,
	1 ST	QUIZ
10 TH	2 ND	Types of Reactions: Vertical reaction, Horizontal reaction, Moment reaction
	3 RD	Types of Beams based on support conditions:
	4 TH	Calculation of support reactions using equations of static equilibrium.
	5 TH	Shear force and bending moment in beams:
	1 ST	Shear Force and Bending Moment: Signs Convention for S.F. and B.M, S.F and B.M of general cases of determinate beams
11 TH	2 ND	S.F and B.M diagrams for Cantilevers,
	3 RD	Simply supported beams and Over hanging beams, Position of maximum BM
	4 TH	Point of contra flexure, Relation between intensity of load, S.F and B.M.
	5 TH	Slope and Deflection

12 TH	1 ST	Introduction: Shape and nature of elastic curve (deflection curve); Relationship between slope, deflection and curvature (No derivation), Importance of slope and deflection.
	2 ND	Slope and deflection of cantilever and simply supported beams under concentrated and uniformly distributed load (by Double Integration method, Macaulay's method).
	3 RD	QUIZ
	4 TH	Indeterminate Beams
	5 TH	Indeterminacy in beams, Principle of consistent deformation/compatibility, Analysis of propped cantilever
13 TH	1 ST	Trusses
	2 ND	Introduction: Types of trusses, statically determinate and indeterminate trusses, degree of indeterminacy, stable and unstable trusses, advantages of trusses
	3 RD	Analysis of trusses: Analytical method (Method of joints, method of Section)
	4 TH	QUIZ
	5 TH	Revision of concepts

LEARNING RESOURCES:

- 1 R.Subramanian Strength of Materials Oxford Publication
- 2 S.Rammrutham, Theory of structure Dhanpat Rai Publications
- 3 V.N.Vazirani&M.M. Rathwani Analysis of Structures-Vol.I&II Khanna Publication.

Rabinarayan Hota
Sign. of Faculty concerned
14/09/22

Madhusmita Dehuri
14/09/22
Sign. of HOD
Madhusmita Dehuri
HOD, Civil Department
Govt. Polytechnic, Koraput



**GOVERNMENT POLYTECHNIC, KORAPUT
DEPARTMENT CIVIL ENGINEERING**

Discipline: CIVIL ENGG	Semester: 3rd	Name of the Teaching Faculty: MADHUSMITA DEHURI, HOD CIVIL
Subject: GEOTECHNICAL ENGINEERING	No. of days/per week class allotted: 05	Semester From date: 15.09.2022 To Date: 22.12.2022 No. of Weeks: 13
PRE-REQUISITE	Basic knowledge about Engineering mechanics, som	
COURSE OUTCOMES	CO1: Comprehend design philosophies and compare those CO2: Refer the design codes CO3: Design simple R.C. structural elements CO4: Draw structural details for construction CO5: Analyze and design structural elements such as beams, columns, staircase etc	
Week	Class Day	Theory / Practical Topics
1 ST	1 ST	Introduction .I Soil and Soil Engineering
	2 ND	Scope of Soil Mechanics
	3 RD	Origin and formation of soil
	4 TH	Preliminary Definitions and Relationship
	5 TH	Soil as a three Phase system.
2 ND	1 ST	Water Content, Density, Specific gravity, Voids ratio, Porosity
	2 ND	Percentage of air voids, air content, degree of saturation, density Index, Bulk/Saturated/dry/submerged density, Interrelationship of various soil parameters
	3 RD	Index Properties of Soil
	4 TH	Water Content , Specific Gravity
	5 TH	Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses
3 RD	1 ST	Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index
	2 ND	Classification of Soil: General
	3 RD	I.S. Classification, Plasticity chart
	4 TH	Revision of concepts
	5 TH	QUIZ
4 TH	1 ST	Permeability and Seepage
	2 ND	Concept of Permeability, Darcy's Law, Co-efficient of Permeability
	3 RD	Factors affecting Permeability.
	4 TH	Constant head permeability and falling head permeability Test.
	5 TH	Seepage pressure, effective stress, phenomenon of quick sand
5 TH	1 ST	Compaction and Consolidation
	2 ND	Compaction: Compaction, Light and heavy compaction Test, Optimum Moisture
	3 RD	Content of Soil, Maximum dry density, Zero air void line, Factors

		affecting Compaction, Field compaction methods and their suitability
	4 TH	Consolidation: Consolidation, distinction between compaction and consolidation.
	5 TH	Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications
6 TH	1 ST	QUIZ
	2 ND	Shear Strength
	3 RD	Concept of shear strength, Mohr- Coulomb failure theory, Cohesion, Angle of internal friction
	4 TH	Revision of concepts
	5 TH	strength envelope for different type of soil, Measurement of shear strength

7 TH	1 ST	Direct shear test, triaxial shear test, unconfined compression test and vane-shear test
	2 ND	Earth Pressure on Retaining Structures
	3 RD	Active earth pressure
	4 TH	Passive earth pressure
	5 TH	QUIZ
8 TH	1 ST	Earth pressure at rest
	2 ND	Use of Rankine's formula
	3 RD	(cohesion-less soil only)
	4 TH	(i) Backfill with no surcharge
	5 TH	(ii) backfill with uniform surcharge
9 TH	1 ST	Foundation Engineering
	2 ND	Functions of foundations, shallow and deep foundation
	3 RD	Different type of shallow and deep foundations with sketches.
	4 TH	Types of failure (General shear, Local shear & punching shear)
	5 TH	Bearing capacity of soil
10 TH	1 ST	QUIZ
	2 ND	Bearing capacity of soils using Terzaghi's formulae
	3 RD	IS Code formulae for strip
	4 TH	Circular and square footings
	5 TH	Revision of concepts
11 TH	1 ST	Circular and square footings.
	2 ND	Further explanation
	3 RD	Effect water table on bearing capacity of soil
	4 TH	Load Carrying capacity of soil
	5 TH	Further explanation
12 TH	1 ST	QUIZ
	2 ND	Introduction to reinforced concrete, grades of concrete and steel, advantages of reinforced cement concrete, concept of under reinforced, balanced & over reinforced section
	3 RD	Assumptions in working stress method, derivation of formula for balanced design
	4 TH	Assumptions in working stress method, derivation of formula for balanced design
	5 TH	Problem discussion on design of the section using WSM
13 TH	1 ST	QUIZ
	2 ND	Revision
	3 RD	Revision
	4 TH	Revision
	5 TH	Revision

LEARNING RESOURCES:

1. Dr. B.C.Punmia, Soil Mechanics & Foundation Engineering, Laxmi publications (P) LTD
2. Dr. K.R.Arora Soil Mechanics & Foundation Engineering Standard Publishers Distributors Ltd
3. Dr. V.N.S. Murthy Soil Mechanics & Foundation Engineering, Vol-I UBS Publishers Distributors Ltd.

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Madhusmita Dehuri



GOVERNMENT POLYTECHNIC, KORAPUT DEPARTMENT CIVIL ENGINEERING

Discipline: CIVIL ENGG	Semester: 3rd	Name of the Teaching Faculty: ABHISEK MOHANTY
Subject: BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY	No. of days/per week class allotted: 05	Semester From date: 15.09.2022 To Date: 22.12.2022 No. of Weeks: 14
PRE-REQUISITE	Basic knowledge about Engineering Construction materials	
COURSE OUTCOMES	CO1: Realize the role of rock, bricks, cement, concrete, timber and steel in construction CO2: Classify buildings on occupancy and comprehend different components CO3: Understand the glossary of terms involved in foundation, masonry, wood works CO4: Grasp the construction details involved in a building CO5: Adopt necessary practices towards green construction	
Week	Class Day	Theory / Practical Topics
1 ST	1 ST	Classification of rock
	2 ND	Uses of stone, natural bed of stone
	3 RD	Qualities of good building stone
	4 TH	Dressing of stone
	5 TH	Characteristics of different types of stone and their uses
2 ND	1 ST	Brick earth – its composition
	2 ND	Brick making – Preparation of brick earth
	3 RD	Moulding, Drying, Burning in kilns
	4 TH	Classification of bricks
	5 TH	Size of traditional and modular bricks
3 RD	1 ST	Qualities of good building bricks
	2 ND	Cement: Types of cements, Properties of cements, Manufacturing of cement
	3 RD	Importance and application of blended cement with fly ash and blast furnace slag.
	4 TH	Mortar: Definition and types of mortar
	5 TH	Sources and classification of sand, Bulking of sand
4 TH	1 ST	Use of gravel, morrum and fly ash as different building material
	2 ND	Concrete: Definition and composition- Water cement ratio- Workability
	3 RD	Mechanical properties and grading of aggregates, mixing, placing, compacting and curing of concrete
	4 TH	Timber: Classification and Structure of timber
	5 TH	Seasoning of timber – Importance.
5 TH	1 ST	Characteristics of good timber

	3 RD	Properties and uses of refractory materials- tiles, terracotta, porcelain glazing
	4 TH	Uses of cast iron, wrought iron,
	5 TH	Mild steel and tor steel
6 TH	1 ST	Composition of Paints
	2 ND	Enamels
	3 RD	Varnishes
	4 TH	Types and uses of surface protective materials
	5 TH	Distempers, Emulsion, French polish and Wax Polish
7 TH	1 ST	Buildings and classification of buildings based on occupancy
	2 ND	Different components of a building.
	3 RD	Site investigation – objectives, site reconnaissance and explorations.
	4 TH	Concept of foundation and its purpose
	5 TH	Types of foundations – shallow and deep
8 TH	1 ST	Shallow foundation-constructural details of : Spread foundations for walls, thumb rules for depth and width of foundation and thickness of concrete block
	2 ND	Deep foundations: Pile foundations-their suitability, classification of piles based on materials, function and method of installation.
	3 RD	Purpose of walls
	4 TH	Classification of walls – load bearing, non-load bearing walls, retaining walls.
	5 TH	Classification of walls as per materials of construction: brick, stone, reinforced brick, reinforced concrete, precast, hollow and solid concrete block and composite masonry walls
9 TH	1 ST	Partition Walls : Suitability and uses of brick and wooden partition walls
	2 ND	Brick masonry : Definition of different terms
	3 RD	Bond – meaning and necessity: English bond for 1 and 1-1/2 Brick thick walls. T, X and right angled corner junctions. Thickness for 1 and 1-1/2 brick square pillars in English bond
	4 TH	Stone Masonry
	5 TH	Glossary of terms –String course, corbel, cornice, block-in-course, grouting, mouldings, templates, throating, through stones, parapet, coping, pilaster and buttress
10 TH	1 ST	Glossary of terms used in doors and windows
	2 ND	Doors – different types of doors
	3 RD	Windows – different types of windows
	4 TH	Purpose of use of arches and lintels
	5 TH	Floors: Glossary of terms ,Types of floor finishes
11 TH	1 ST	Cast-in-situ, concrete flooring(monolithic, bonded), terrazzo tile flooring, cast in situ Terrazzo flooring, timber flooring
	2 ND	Roofs: Glossary of terms, Types of roofs, concept and function of flat, pitched, hipped and Sloped roofs
	3 RD	Stairs: Glossary of terms; Stair case, winder, landing, stringer, newel, baluster, rise, tread, width of stair case, hand rail, nosing, head room, mumty room.
	4 TH	Various types of stair case – straight flight, dog legged, open well, quarter turn, half turn

	5 TH	Bifurcated stair, spiral stair, cantilever stair, tread riser stair
12 TH	1 ST	Plastering – purpose – Types of plastering
	2 ND	Types of plaster finishes – Grit finish, rough cast, smooth cast, sand faced, pebble dash, acoustic plastering and plain plaster etc.
	3 RD	Proportion of mortars used for different plasters, preparation of mortars, techniques of plastering and curing
	4 TH	Pointing – purpose – Types of pointing
	5 TH	Painting – objectives – method of painting new and old wall surfaces, wood surface and metal surfaces – powder coating and spray painting on metal surfaces.
13 TH	1 ST	White washing – Colour washing – Distempering – internal and external walls.
	2 ND	Damp and Termite proofing – Materials and Methods
	3 RD	Concept of green building
	4 TH	Introduction to Energy Management and Energy Audit of Buildings.
	5 TH	Aims of energy management of buildings.
14 TH	1 ST	Types of energy audit, Response energy audit questionnaire
	2 ND	Energy surveying and audit report.
	3 RD	QUIZ
	4 TH	REVISION
	5 TH	DOUBT CLEARING CLASS

LEARNING RESOURCES:

- 1 Building materials & Construction by N. Subramanian
- 2 Engineering Materials by Rangwala
- 3 Building Construction by Rangwala
- 4 Construction Technology by Sarkar & Saraswati

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**GOVERNMENT POLYTECHNIC, KORAPUT
DEPARTMENT CIVIL ENGINEERING**

Discipline: CIVIL ENGG	Semester: 3rd	Name of the Teaching Faculty: SHREEKANTA SAMAL, PTGF
Subject: ESTIMATING & COST EVALUATION - I	No. of days/per week class allotted: 04	Semester From date: 15.09.2022 To Date: 22.12.2022 No. of Weeks: 13
PRE-REQUISITE	Basic knowledge about Engg. Drawing, Construction and Rate of materials	
COURSE OUTCOMES	CO1: Understand the significance of accurate estimation practices. CO2: Evaluate and generate component wise estimates for a building CO3: Develop a proper cost estimate for single storeyed building. CO4: Analyse and offer reason behind the costs involved in different components CO5: Prepare abstract of cost estimates in line with prescription by state regulating bodies.	
Week	Class Day	Theory / Practical Topics
1 ST	1 ST	1. Introduction 1.1.Types of estimates – Plinth area, floor area / carpetarea
	2 ND	1.2. Units and modes of measurements as per IS1200
	3 RD	1.2. Units and modes of measurements as per IS1200
	4 TH	1.3. Accuracy of measurement for different item ofwork
2 ND	1 ST	2.0.Quantity Estimate of Building 2.1.Short wall long wall method and centre line method
	2 ND	2.0.Quantity Estimate of Building 2.1.Short wall long wall method and centre line method
	3 RD	2.1. Short wall long wall method and centre line method
	4 TH	2.1.deductions in masonry, plastering, white washing, painting etc.,
3 RD	1 ST	2.1. multiplying factor (paint coefficients) for painting of doors and windows (paneled/glazed), grillsetc.
	2 ND	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mumty room.
	3 RD	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mumty room.
	4 TH	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mumty room.
4 TH	1 ST	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mumty room.
	2 ND	2.2. Detailed estimate of single storied flat roof building with shallow foundation & RCC roof slab with leak proof treatment over it including staircase and mumty room.

	3 RD	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mummy room..
	4 TH	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mummy room.
5 TH	1 ST	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mummy room.
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	3 RD	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mummy room.
	4 TH	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mummy room.
6 TH	1 ST	QUIZ
	2 ND	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mummy room.
	3 RD	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mummy room.
	4 TH	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mummy room.

7 TH	1 ST	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mummy room.
	2 ND	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mummy room.
	3 RD	2.2. Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mummy room.
	4 TH	3.0. Analysis of Rates and Valuation 3.1. Analysis of rates for cement concrete, brick masonry in Cement Mortar, laterite stone masonry in Cement Mortar ,cement plaster, white washing, Artificial Stone flooring
8 TH	1 ST	INTERNAL ASSESSMENT
	2 ND	INTERNAL ASSESSMENT
	3 RD	3.1. Analysis of rates for Tile flooring, concrete flooring, R.C.C. with centering and shuttering, reinforcing steel
	4 TH	3.1. Analysis of rates for Painting of doors and windows etc. as per OPWD.
9 TH	1 ST	3.2. Calculation of lead, lift, conveyance charges, royalty of materials, etc. as per Orissa P.W.D. system (Concept of C.P.W.D./Railways provisions)
	2 ND	3.2. Calculation of lead, lift, conveyance charges, royalty of materials, etc. as per Orissa P.W.D. system (Concept of C.P.W.D./Railways provisions)
	3 RD	3.2. Calculation of lead, lift, conveyance charges, royalty of materials, etc. as per Orissa P.W.D. system (Concept of C.P.W.D./Railways provisions)
	4 TH	3.2. Calculation of lead, lift, conveyance charges, royalty of materials, etc. as per Orissa P.W.D. system (Concept of C.P.W.D./Railways provisions)
10 TH	1 ST	3.3. Abstract of cost of estimate.

	2 ND	QUIZ
	3 RD	3.3. Abstract of cost of estimate.
	4 TH	3.4. Valuation- Value and cost, scrap value, salvage value, assessed value, sinking fund
11 TH	1 ST	3.4. depreciation and obsolesce
	2 ND	3.4. Methods of valuation
	3 RD	4. Administrative Set-Up of engineering Organisations: 4.1. Administrative set-up and hierarchy of Engineering department in State Govt./Central Govt./PSUs/Private Sectors etc
	4 TH	4.1. Administrative set-up and hierarchy of Engineering department in State Govt./Central Govt./PSUs/Private Sectors etc
12 TH	1 ST	4.1 .Duties and responsibilities of Engineers at different positions /levels
	2 ND	4.1 .Duties and responsibilities of Engineers at different positions /levels
	3 RD	QUIZ
13 TH	4 TH	Previous year question discussion
	1 ST	Previous year question discussion
	2 ND	Revision
	3 RD	Revision
	4 TH	Revision

LEARNING RESOURCES:

1. Dr. B.N.Dutta, Estimating & Costing – UBSPD Publisher
2. Dr. M.Chakraborty. Estimating, Costing, specification & Valuation of Civil Engg.Published by Author
3. Govt. of Odisha, Latest Odisha Schedule of Rates & Analysis of rates.

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Madhusmita Dehuri
HOD, Civil Department

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**GOVERNMENT POLYTECHNIC, KORAPUT DEPARTMENT
CIVIL ENGINEERING**

Discipline: CIVIL ENGG	Semester: 3rd	Name of the Teaching Faculty:- SIBA SANKAR CHANDA V& SHREEKANT SAMAL ,PTGF
Subject: ENVIRONMENTAL STUDIES	No. of days per week class allotted: 04	Semester From date: 15.09.2022 To Date: 22.12.2022 No. of Weeks: 13
PRE-REQUISITE	Basic knowledge about environmental factors.	
COURSE OUTCOMES	CO1: The Multidisciplinary nature of environmental studies CO2: Natural Resources CO3: Systems CO4: Biodiversity and it's Conservation CO5: Environmental Pollution CO6: Social issues and the Environment CO7: Human population and the environment	
Week	Class Day	Theory / Practical Topics
1st	1st	The Multidisciplinary nature of environmental studies: Definition, scope and importance.
	2nd	Need for public awareness
	3rd	Natural Resources: Renewable and non renewable resources:
	4th	Natural resources and associated problems.
2nd	1st	Forest resources: Use and over-exploitation, deforestation, case studies
	2nd	Timber extraction mining, dams and their effects on forests And Tribal people.
	3rd	Water resources: Use and over-utilization of surface and ground water
	4th	floods, drought, conflicts over water, dam's benefits and problems.
3rd	1st	Mineral Resources: Use and exploitation, environmental effects of extracting and using mineralresources.
	2nd	Food Resources: World food problems, changes caused by agriculture and over grazing
	3rd	effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity
	4th	Energy Resources: Growing energy need, renewable andnon-renewable energy sources, use of alternate energy sources, case studies.
4th	1st	Land Resources: Land as a resource, land degradation, man induceslandslides, soil erosion, anddesertification.
	2nd	Role of individual in conservation of natural resources.
	3rd	Equitable use of resources for sustainable life styles.
	4th	Systems: Concept of an eco system.
5th	1st	Structure and function of an eco system. Producers, consumers, decomposers.
	2nd	Energy flow in the eco systems.
	3rd	Ecological succession.
	4th	Food chains, food webs and ecological pyramids

6th	1st	Introduction, types, characteristic features, structure and function of the following eco system:
	2nd	Forest ecosystem: Aquatic eco systems (ponds, streams, lakes, rivers, oceans, estuaries).
	3rd	Biodiversity and it's Conservation: Introduction-Definition:
	4th	genetics, species and ecosystem diversity
7th	1st	Biogeographically classification of India.
	2nd	Value of biodiversity: consumptive use, productive use, social ethical, aesthetic and optin values
	3rd	Biodiversity at global, National and local level.
	4th	Threats to biodiversity: Habitats loss, poaching of wild life, man wildlife conflicts
8th	1st	Environmental Pollution: Definition Causes, effects and control measures of: Air pollution.
	2nd	Water pollution.
	3rd	Soil pollution
	4th	Marine pollution
9th	1st	Noise pollution.
	2nd	Thermal pollution
	3rd	Nuclear hazards.
	4th	Solid waste Management: Causes,
10th	1st	effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.
	2nd	Disaster management: Floods, earth quake, cyclone and landslides.
	3rd	Social issues and the Environment: Form unsustainable to sustainable development, Urban problems related to energy
	4th	Water conservation, rain water harvesting, water shed management.
11th	1st	Resettlement and rehabilitation of people; its problems and concern
	2nd	Environmental ethics: issue and possible solutions.
	3rd	Climatechange, globalwarming,acidrain,ozonelayerdepletion, nuclear accidents and holocaust, case studies.
	4th	Air (prevention and control of pollution) Act.
12th	1st	Water (prevention and control of pollution) Act
	2nd	Public awareness.
	3rd	Human population and the environment: Population growth and variation among nations
	4th	Population explosion, family welfare program, Environment and human health.
13th	1st	Human rights.
	2nd	Value education, Role of information technology in environment and human health.
	3rd	REVISION
	4th	QUIZ

Learning Resources:

1. Textbook of Environmental studies Erach Bharucha # UGC
2. Fundamental concepts in EnvironmentalStudies D.D. Mishra S.Chand & Co-Ltd
3. TextbookofEnvironmental Studies K.RaghavanNambiar SCITECHPublicationPvt. Ltd
4. Environmental Engineering V.M.Domkundwar Dhanpat Rai & Co.

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**GOVERNMENT POLYTECHNIC, KORAPUT
DEPARTMENT CIVIL ENGINEERING**

Discipline: CIVIL	Semester: 3rd	Name of the Teaching Faculty: ABHISEK MOHANTY , PTGF
Subject: CIVIL ENGINEERING LABORATORY I	No. of days/per week class allotted: 06	Semester From date: 15.09.2022 To Date: 22.12.2022 No. of Weeks: 13
PRE-REQUISITE	Basic knowledge about building material and concrete structure.	
COURSE OUTCOMES	CO1. Use Universal testing machine to determine the stress-strain relation in steel. CO2. Carry out tests to determine cement characteristics and strength. CO3. Investigate properties of aggregates CO4. Conduct tests to determine concrete workability and compressive strength CO5. To perform non-destructive tests on concrete CO6. To conduct strength tests on different types of bricks	
Week	Class Day	Theory / Practical Topics
1 ST	1 ST	Determination of Young's Modulus of steel in a tensile testing machine.
	2 ND	Do
	3 RD	Do
	4 TH	Determination of fineness of Cement by sieving.
	5 TH	Do
	6 TH	Do
2 ND	1 ST	Determination of normal Consistency, initial and final setting time of Cement
	2 ND	Do
	3 RD	Do
	4 TH	Determination of soundness of Cement by Le-Chatelier apparatus.
	5 TH	Do
	6 TH	Do
3 RD	1 ST	Determination of Compressive Strength of cement.
	2 ND	Do
	3 RD	Do
	4 TH	Determination of Compressive Strength of Burnt clay, Fly Ash Bricks and Blocks.
	5 TH	Do
	6 TH	Do.
4 TH	1 ST	Grading of Fine & Coarse aggregate by sieving for concrete .
	2 ND	Do

5 TH	3 RD	Do
	4 TH	Determination of Specific Gravity and Bulking of sand.
	5 TH	Do
	6 TH	Do
	1 ST	Determination of Specific Gravity and Bulk density of coarse aggregate.
	2 ND	Do
6 TH	3 RD	Do
	4 TH	Grading of Road Aggregates.
	5 TH	Do
	6 TH	Do
	1 ST	Determination of Flakiness, Elongation of Road aggregates.
	2 ND	Do
7 TH	3 RD	Do
	4 TH	Determination of Crushing Value Test of aggregates
	5 TH	Do
	6 TH	Do
	1 ST	Los-Angeles Abrasion Test of aggregate.
	2 ND	Do
8 TH	3 RD	Do
	4 TH	Impact test of aggregate.
	5 TH	Do
	6 TH	Do
	1 ST	Determination of soundness test of road aggregates.
	2 ND	Do
9 TH	3 RD	Do
	4 TH	Do
	5 TH	Do
	6 TH	Do
	1 ST	Determination of Compressive Strength of concrete cubes
	2 ND	Do
10 TH	3 RD	Do
	4 TH	Do
	5 TH	Do
	6 TH	Do
	1 ST	Determination of Workability of concrete by: a) Slump Cone method,
	2 ND	Do
11 TH	3 RD	Do
	4 TH	b) Compaction Factor method.
	5 TH	Do
	6 TH	Do
	1 ST	Demonstration on Rebound hammer
	2 ND	Do
12 TH	3 RD	Do
	4 TH	Do
	5 TH	Do
	6 TH	Do
	1 ST	Ultrasonic Pulse Velocity measuring Instrument.

	6TH	Do
13 TH	1 ST	Record marking and final viva
	2 ND	Do
	3 RD	Do
	4 TH	Do
	5 TH	Do
	6 TH	Do

LEARNING RESOURCES :

1. Concrete Manual-A Laboratory Manual For Quality of Concrete, M. L. Gambhir # Dhanpat Rai & Co. Pvt. Ltd.
2. Cement, Aggregate and concrete Laboratory Manual, Dr. M.Chakraborty
3. Highway material testing Laboratory manua, S.K.Khanna & C.E.G.Justo

Abhisek Mohanty.
Sign. of Faculty concerned
15/9/22

15/9/22
Sign. of HOD
Madhusmita Dehuri
HOD, Civil Department
Govt. Polytechnic, Koraput



**GOVERNMENT POLYTECHNIC, KORAPUT
DEPARTMENT CIVIL ENGINEERING**

Discipline: CIVIL ENGG.	Semester: 3rd	Name of the Teaching Faculty: SHREEKANTA SAMAL, PTGF
Subject: CIVIL ENGINEERING DRAWING I	No. of days/per week class allotted: 05	Semester From date: 15.09.2022 To Date: 22.12.2022 No. of Weeks: 13
PRE-REQUISITE	Basic knowledge about Engg. Drawing & AutoCAD	
COURSE OUTCOMES	CO1: Use AutoCAD modules to prepare engineering drawings CO2: Comprehend various drawing commands available in CAD software CO3: Prepare plan, elevation and section views of flat roof buildings CO4: Prepare plan, elevation and section views of inclined roof buildings CO5: Generate drawings of building citing material differences	
Week	Class Day	Theory / Practical Topics
1ST	1ST	1. AutoCAD SOFTWARE. 1.1 Recap of the Draw, Format, Edit, Dimension, Modify commands
	2ND	Do
	3RD	Do
	4TH	Do
	5TH	Do
2ND	1ST	1.2 Draw 2D drawings of the following Building Components - Doors, Windows, Cross section through wall, Spread footing, Column footing, Stairs case, R.C.C. T-beam and slab
	2ND	Do
	3RD	Do
	4TH	Do
	5TH	Do
3RD	1ST	1.3 Develop Isometric drawings of simple objects
	2ND	Do
	3RD	Do
	4TH	Do
	5TH	Do
4TH	1ST	1.4 Develop 3D drawings of simple objects.

	2 ND	Do
	3 RD	Do
	4 TH	Do
	5 TH	Do
5 TH	1 ST	2 PLAN, ELEVATION AND SECTIONAL ELEVATION OF FLAT ROOF BUILDING FROM LINE DIAGRAM AND GIVEN SPECIFICATIONS with use of AutoCAD software. 2.1 Plan at window sill level of a single storeyed R.C. roof slab building with elevation and sectional views form given line diagram and specification.
	2 ND	Do
	3 RD	Do
	4 TH	Do
	5 TH	Do
6 TH	1 ST	2.2 Detail drawing of Double storeyed pucca building with R.C.C. stair case from line diagram and given specification.
	2 ND	Do
	3 RD	Do
	4 TH	Do
	5 TH	Do
7 TH	1 ST	2.3 Preparation of approval drawing of a residential building as per the norms of local approving authority with site plan, index plan etc
	2 ND	Do
	3 RD	Do
	4 TH	Do
	5 TH	Do
8 TH	1 ST	3 PLAN, ELEVATION AND SECTION OF INCLINED ROOF BUILDING WITH AC SHEET/GCI/TILES ON WOODEN STRUCTURE with use of AutoCAD Commands Detail drawing of inclined roof building from given line diagram and specification. (gabled / hipped)
	2 ND	Do
	3 RD	Do
	4 TH	Do
	5 TH	Do
9 TH	1 ST	4. BUILDING PLANNING 4.1 Planning of buildings for specific cost based on approximate plinth area rate.
	2 ND	Do
	3 RD	Do

	4 TH	Do
	5 TH	Do
10 TH	1 ST	4.2 Orientation of buildings, location of openings and living areas.
	2 ND	Do
	3 RD	Do
	4 TH	Do
	5 TH	Do
11 TH	1 ST	4.3 Line plan of School, hostel, market complex and dispensary building. E. RECOMMENDED
	2 ND	Do
	3 RD	Do
	4 TH	Do
	5 TH	Do
12 TH	1 ST	Record checking and test
	2 ND	Do
	3 RD	Do
	4 TH	Do
	5 TH	Do
13 TH	1 ST	Final viva
	2 ND	Do
	3 RD	Do
	4 TH	Do
	5 TH	Do

LEARNING RESOURCES :

1. M.Chakrobarty , Civil Engg. Drawing , M.Chakrobarty.
2. B.P.Verma, Civil Engineering drawing & House Planning , Khanna Publishers
3. V.Thanikachalama & K.V Natarajan, Civil Engineering drawing Manual, S Chand & Co Pvt Ltd

Shreekantha Samal
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**GOVERNMENT POLYTECHNIC, KORAPUT DEPARTMENT
CIVIL ENGINEERING**


Discipline: CIVIL ENGG	Semester: 3rd	Name of the Teaching Faculty: SIBA SANKAR CHANDA, PTGF
Subject: ESTIMATION PRACTICE-1	No. of days/per week class allotted: 03	Semester From date: 15.09.2022 To Date: 22.12.2022 No. of Weeks: 13
PRE-REQUISITE	Basic knowledge about Engineering drawing and estimation.	
COURSE OUTCOMES	CO1:- Prepare estimates fir 2 room single storey building CO2:- Prepare estimate for 2 storeyed buildings CO3: Comprehend the schedule and analysis of rates offered by State Work Department CO4: Use MX Excel to prepare analysis of rates CO5: Evaluate dry material list and cost associated using MS Excel CO6: Prepare abstract of costs and bill of materials for single storey and double storey buildings	
Week	Class Day	Theory / Practical Topics
1st	1st	1.0 Preparation of plinth area estimate & detailed estimate for the following ; 1.1 Single storeyed two roomed building with specification as per Orissa P.W.D. schedule of rates and analysis of rates
	2nd	Practice
	3rd	Practice
2nd	1st	Practice
	2nd	Practice
	3rd	Practice
3rd	1st	Practice
	2nd	Practice
	3rd	RECORD CHECKING & TEST
4th	1st	1.2 A two storeyed pucca Building with specification as per Orissa P.W.D. schedule of rates and analysis of rates
	2nd	Practice
	3rd	Practice
5th	1st	Practice
	2nd	Practice
	3rd	Practice
6th	1st	Practice
	2nd	Practice
	3rd	Practice
7th	1st	Practice
	2nd	Practice
	3rd	RECORD CHECKINF & TEST

8th	1st	Analysis of rates in detail for the above items of works basing on Orissa Govt. analysis of rate with help of MS Excel software
	2nd	Practice
	3rd	Practice
9th	1st	Practice
	2nd	Practice
	3rd	RECORD CHECKING & TEST
10th	1st	Calculation of dry materials for different items of building basing On Orissa Govt. analysis of rate with help of MS Excel software.
	2nd	Practice
	3rd	Practice
11th	1st	Practice
	2nd	Practice
	3rd	RECORD CHECKING & TEST
12th	1st	Preparation of abstract of cost and bill of quantities of the estimates as per item no. 1.0 above with help of MS Excel software
	2nd	Practice
	3rd	Practice
13th	1st	RECORD CHECKING & TEST
	2nd	FINAL VIVA
	3rd	FINAL VIVA

Learning Resources:-

1. Estimating, Costing, specification & Valuation in Civil Engineering , M.Chakrobarty #Chakrobarty
2. Estimating & Costing in Civil Engg. B.N.Dutta #UBS Publishers' Distributors Pvt. Ltd
3. Text Book of Estimating & Costing, G.S.Birdie #Dhanpat Rai Publishing Company Pvt. Ltd
4. Latest Orissa PWD Schedule of Rates & Analysis of rates , Govt. of Odisha #Govt. of Odish

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15/9/22
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**GOVERNMENT POLYTECHNIC, KORAPUT
DEPARTMENT CIVIL ENGINEERING**

Discipline: CIVIL ENGG.	Semester: 3rd	Name of the Teaching Faculty: RABINARAYAN HOTA , PTGF
Subject: STUDENT CENTRED ACTIVITIES	No. of days/per week class allotted: 03	Semester From date: 15.09.2022 To Date: 22.12.2022 No. of Weeks: 13
PRE- REQUISITE	Basic knowledge about English language and technical concepts.	
COURSE OUTCOMES	CO1: CO2: CO3: CO4	
Week	Class Day	Theory / Practical Topics
1ST	1ST	Behavioural skills
	2ND	Practice
	3RD	Practice
2ND	1ST	Tell me about yourself.
	2ND	Practice
	3RD	Practice
3RD	1ST	Writing Skills
	2ND	Practice
	3RD	Practice
4TH	1ST	How to write a formal mail
	2ND	Practice
	3RD	Practice
5TH	1ST	How to write a memo & script writing
	2ND	Practice
	3RD	Practice
6TH	1ST	Developing visualizing skills
	2ND	Practice
	3RD	Practice
7TH	1ST	Communication and verbal ability
	2ND	Practice
	3RD	Practice
8TH	1ST	How to make a CV
	2ND	Practice

	3 RD	Practice
9 TH	1 ST	How to make a Resume
	2 ND	Practice
	3 RD	Practice
10 TH	1 ST	Making of a story
	2 ND	Practice
	3 RD	Practice
11 TH	1 ST	Making of PPT (power-point presentation)
	2 ND	Practice
	3 RD	Practice
12 TH	1 ST	Debate
	2 ND	Practice
	3 RD	Practice
13 TH	1 ST	Role play
	2 ND	Practice
	3 RD	Practice

LEARNING RESOURCES:

1. Business Communication- concepts, cases & applications, Chaturvedi & Chaturvedi
2. Soft Skills K Alex, S Chand
3. Business Communication for Managers, P. Mehra, Pearson

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