LESSON PLAN OF Th1. STRUCTURAL MECHANICS GOVT. POLYTECHNIC, BERHAMPUR		
Discipline: CIVIL ENGG.	Semester: 3rd	NAME OF THE FACULTY: SANDEEP MARNDY
Subject: Th1. STRUCTURAL MECHANICS	No. of days/ per week class allotted: 5	Semester From Date : 01/08/2023 To Date: 30/11/2023 No. of Weeks: 15
Week	Class Day	Theory
		1.0 Review Of Basic Concepts
1st	1st	1.1 Basic Principle of Mechanics: Force, Moment, support conditions
	2nd	Conditions of equilibrium, C.G & MI, Free body diagram
	3rd	1.2 Review of CG of different sections
	4th	Review of MI of different sections
		2.0 Simple And Complex Stress, Strain
	5th	2.1 Simple Stresses and StrainsIntroduction to stresses and strains: Mechanical properties of materials – Rigidity, Elasticity, Plasticity, Compressibility, Hardness, Toughness, Stiffness, Brittleness, Ductility, Malleability, Creep, Fatigue, Tenacity, Durability,
2nd	1st	Types of stresses -Tensile, Compressive and Shear stresses, Types of strains - Tensile, Compressive and Shear strains
	2nd	Complimentary shear stress - Diagonal tensile / compressive Stresses due to shear, Elongation and Contraction, Longitudinal and Lateral strains, Poisson's Ratio, Volumetric strain
	3rd	computation of stress, strain, Poisson's ratio, change in dimensions and volume etc,
	4th	Hooke's law - Elastic Constants, Derivation of relationship between the elastic constants.
	5th	2.2 Application of simple stress and strain in engineering field:Behaviour of ductile and brittle materials under direct loads, Stress Strain curve of a ductile material
3rd	1st	Limit of proportionality, Elastic limit, Yield stress, Ultimate stress, Breaking stress, Percentage elongation, Percentage reduction in area,
	2nd	Significance of percentage elongation and reduction in area of cross section,
	3rd	Deformation of prismatic bars due to uniaxial load
	4th	Deformation of prismatic bars due to its self weight
	5th	2.3 Complex stress and strainPrincipal stresses and strains: Occurrence of normal and tangential stresses
4th	1st	Concept of Principal stress and Principal Planes,
	2nd	major and minor principal stresses and their orientations,
	3rd	Mohr's Circle and its application
	4th	application to solve problems of complex stresses Using Mohr's Circle
		3.0 Stresses In Beams and Shafts
	5th	3.1 Stresses in beams due to bending: Bending stress in beams – Theory of simple bending – Assumptions – Moment of resistance – Equation for Flexure

5th	1st	Flexural stress distribution – Curvature of beam – Position of N.A. and Centroidal Axis
	2nd	Flexural rigidity – Significance of Section modulus 3.2 Shear stresses in beams: Shear stress distribution in beams of rectangular
	3rd	Shear stress distribution in beams of circular section
	4th	Shear stress distribution in beams of circular section and standard sections symmetrical about vertical axis 3.3 Stresses in shafts due to torsion: Concept of torsion, basic assumptions of pure torsion,
	5th	torsion of solid and hollow circular sections, polar moment of inertia, torsional shearing stresses, angle of twist
6th	1st	torsional rigidity, equation of torsion 3.4 Combined bending and direct stresses: Combination of stresses, Combined direct and bending stresses,
	2nd	Maximum and Minimum stresses in Sections, Conditions for no tension,
	3rd	Limit of eccentricity, Middle third/fourth rule, Core or Kern for square
	4th	rectangular and circular sections, chimneys, dams and retaining walls
		4.0 Columns and Struts
	5th	4.1 Columns and Struts, Definition, Short and Long columns,
7th	1st	End conditions, Equivalent length / Effective length, Slenderness ratio,
	2nd	Axially loaded short and long column, Euler's theory of long columns,
	3rd	Critical load for Columns with different end conditions
		5.0 Shear Force and Bending Moment
	4th	5.1 Types of loads and beams: Types of Loads: Concentrated (or) Point load, Uniformly Distributed load (UDL)
	5th	Types of Supports: Simple support, Roller support, Hinged support, Fixed support
8th	1st	Types of Reactions: Vertical reaction, Horizontal reaction, Moment reaction
	2nd	Types of Beams based on support conditions:
	3rd	Calculation of support reactions using equations of static equilibrium.
	4th	Calculation of support reactions using equations of static equilibrium.
	5th	5.2 Shear force and bending moment in beams:Shear Force and Bending Moment: Signs Convention for S.F. and B.M,
9th	1st	S.F and B.M of general cases of determinate beams with concentrated loads and udl only
	2nd	S.F and B.M diagrams for Cantilevers, Simply supported beams and
	3rd	S.F and B.M diagrams for Over hanging beams
	4th	Position of maximum BM, Point of contra flexure
	5th	Relation between intensity of load, S.F and B.M.
		6.0 Slope and Deflection
10th	1st	6.1 Introduction: Shape and nature of elastic curve (deflection curve);
	2nd	Relationship between slope, deflection and curvature (No derivation),
	3rd	Relationship between slope, deflection and curvature (No derivation),
	4th	Importance of slope and deflection
	5th	6.2 Slope and deflection of cantilever
11th	1st	and simply supported beams under concentrated and uniformly distributed load
	2nd	Double Integration method

	3rd	Double Integration method
	4th	Macaulay's method
		7.0 Indeterminate Beams
	5th	7.1 Indeterminacy in beams,
12th	1st	Principle of consistent deformation/compatibility
	2nd	Principle of consistent deformation/compatibility
	3rd	Principle of consistent deformation/compatibility
	4th	Analysis of propped cantilever, fixed and two span continuous beams by principle of superposition
	5th	Analysis of propped cantilever, fixed and two span continuous beams by principle of superposition
13th	1st	Analysis of propped cantilever, fixed and two span continuous beams by principle of superposition
	2nd	SF and BM diagrams (point load and udl covering full span)
	3rd	SF and BM diagrams (point load and udl covering full span)
	4th	SF and BM diagrams (point load and udl covering full span)
		8.0 Trusses
	5th	8.1 Introduction: Types of trusses, statically determinate and indeterminate trusses
14th	1st	statically determinate and indeterminate trusses
	2nd	statically determinate and indeterminate trusses
	3rd	degree of indeterminacy, stable and unstable trusses, advantages of trusses.
	4th	degree of indeterminacy, stable and unstable trusses, advantages of trusses.
	5th	8.2 Analysis of trusses: Analytical method
15th	1st	Method of joints
	2nd	Method of joints
	3rd	method of Section
	4th	method of Section
	5th	problem solving

Sanjay Mannaly
27/07/2023
(Lect. Civil)

27/7/2023
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LESSON PLAN WATER SUPPLY AND WASTE WATER ENGINEERING (Th.4)

Discipline: CIVIL ENGINEERING	Semester: 5th	Name of the Teaching faculty: SANDEEP MARNDY
Subject: WATER SUPPLY AND WASTE WATER ENGINEERING	No. of Days/Per Week class alotted:5	Semester From date: 01/08/2023 To Date: 30/11/2023 No. of Weeks: 15
Week	Class Day	Theory/Practical Topics
		SECTION A: WATER SUPPLY
		1.Introduction to Water Supply, Quantity and Quality of water
1st	1st	Necessity of treated water supply
	2nd	Per capita demand, variation in demand and factors affecting demand
	3rd	Per capita demand, variation in demand and factors affecting demand
	4th	Methods of forecasting population, Numerical problems using different methods
	5th	Methods of forecasting population, Numerical problems using different methods
2nd	1st	Methods of forecasting population, Numerical problems using different methods
	2nd	Impurities in water – organic and inorganic, Harmful effects of impurities
	3rd	Analysis of water –physical, chemical and bacteriological
	4th	Analysis of water –physical, chemical and bacteriological
	5th	Water quality standards for different uses
		2.Sources and Conveyance of water
3rd	1st	Surface sources – Lake, stream, river and impounded reservoir
	2nd	Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well
	3rd	Yield from well- method s of determination, Numerical problems using yield formulae (deduction excluded)
	4th	Yield from well- method s of determination, Numerical problems using yield formulae (deduction excluded)
	5th	Intakes – types, description of river intake, reservoir intake, canal intake
4th	1st	Pumps for conveyance & distribution – types, selection, installation
	2nd	Pipe materials – necessity, suitability, merits & demerits of each type
	3rd	Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method
		3.Treatment of water
	4th	Flow diagram of conventional water treatment system
	5th	Treatment process / units :Aeration ; Necessity
5th	1st	Plain Sedimentation : Necessity
	2nd	working principles, Sedimentation tanks – types, essential features, operation & maintenance
	3rd	Sedimentation with coagulation: Necessity, principles of coagulation

	4th	types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only)
	5th	Filtration : Necessity, principles, types of filters
6th	1st	Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features
	2nd	Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination
	3rd	Disinfection : Necessity, methods of disinfection Chlorination – break point chlorination, super chlorination
	4th	Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)
	5th	Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)
		4.Distribution system And Appurtenance in distribution system:
7th	1st	General requirements, types of distribution system-gravity, direct and combined
	2nd	General requirements, types of distribution system-gravity, direct and combined
	3rd	Methods of supply – intermittent and continuous
	4th	Methods of supply – intermittent and continuous
	5th	Distribution system layout – types, comparison, suitability
8th	1st	Distribution system layout – types, comparison, suitability
	2nd	Valves-types, features, uses, purpose-sluice valves, check valves, air valves,scour valves, Fire hydrants, Water meters
	3rd	Valves-types, features, uses, purpose-sluice valves, check valves, air valves,scour valves, Fire hydrants, Water meters
		5.W/s plumbing in building :
	4th	Method of connection from water mains to building supply
	5th	General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code
		SECTION B: WASTE WATER ENGINEERING
		6.Introduction
9th	1st	Aims and objectives of sanitary engineering
	2nd	Definition of terms related to sanitary engineering
	3rd	Systems of collection of wastes– Conservancy and Water Carriage System – features
	4th	Systems of collection of wastes– Conservancy and Water Carriage System – comparison
	5th	Systems of collection of wastes– Conservancy and Water Carriage System –suitability
		7.Quantity and Quality of sewage
10th	1st	Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow,
	2nd	numerical problem on computation quantity of sanitary sewage
	3rd	Computation of size of sewer, application of Chazy's formula,
	4th	Limiting velocities of flow : self-cleaning and scouring
	5th	General importance, strength of sewage, Characteristics of sewage-physical,chemical & biological
11th	1st	Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD,COD

	2nd	Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD,COD
		8.Soworage system
	3rd	Types of system-separate, combined, partially separate , features, comparison between the types, suitability
	4th	Types of system-separate, combined, partially separate , features, comparison between the types, suitability
	5th	Shapes of sewer – rectangular, circular, avoid-features, suitability
12th	1st	Shapes of sewer – rectangular, circular, avoid-features, suitability
	2nd	Laying of sewer-setting out sewer alignment
		9.Sewer appurtenances and Sewage Disposal:
	3rd	Manholes and Lamp holes – types, features, location, function
	4th	Inlets, Grease & oil trap – features, location, function
	5th	Storm regulator, inverted siphon – features, location, function
13th	1st	Disposal on land – sewage farming, sewage application and dosing
	2nd	sewage sickness-causes and remedies
	3rd	Disposal by dilution – standards for disposal in different types of water bodies
	4th	self purification of stream
		10.Sewage treatment :
	5th	Principles of treatment
14th	1st	flow diagram of conventional treatment
	2nd	Primary treatment – necessity, principles, essential features, functions
	3rd	Primary treatment – necessity, principles, essential features, functions
	4th	Primary treatment – necessity, principles, essential features, functions
	5th	Secondary treatment – necessity, principles, essential features, functions
15th	1st	Secondary treatment – necessity, principles, essential features, functions
	2nd	Secondary treatment – necessity, principles, essential features, functions
		11.Sanitary plumbing for building :
	3rd	Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
	4th	Plumbing arrangement of single storied & multi storied building as per I.S. code practice
	5th	Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti syphonage pipe

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LESSON PLAN OF 3RD SEMESTER(2023-24) CIVIL ENGINEERING

Discipline :- CIVIL	Semester:-3RD	Name of the Teaching Faculty:-INDU BHARATI MAHAPATRA (PTGF,CIVIL) GOVT. POLYTECHNIC, BERHAMPUR
Subject:- Geotechnical engineering	No of Days/per Week Class Allotted :-04	Semester From:- **1ST AUG,2023** To:-**30TH NOV,2023** No of Weeks:- **15**
Week	**Class Day**	**Theory Topics**
1st	1st	**Geo-technical Engineering** introduction
	2nd	1.2Soil and Soil Engineering
	3rd	1.3Scope of soil Mechanics
	4th	1.4 Origin and Formation of soil
2nd	1st	2. Preliminary Definition and Relationship
	2nd	2.1 Soil as a three phase system
	3rd	2.2 Water Content, Density, Specific gravity, Voids ratio, porosity, percentage of air voids
	4th	Air content, degree of saturation, density index,Bulk/Saturated/Dry
3rd	1st	Submerged density,inter relationship of various soil parameters.
	2nd	Index properties of soil 3.1 Water Content
	3rd	3.2 Specific gravity
	4th	3.3 particle size distribution, Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses
4th	1st	Consistency of solids, Atterbergs limits, plasticity index, consistency index,
	2nd	Liquidity index
	3rd	Classification of soil
	4th	General Classification,
5th	1st	Plasticity chart Permeability
	2nd	**Classification Seepage**
	3rd	Concept of Permeability, Darcy's Law, Coefficient of Permeability
	4th	Factors affecting Permeability
6th	1st	Constant head permeability and falling head permeability test
	2nd	Seepage pressure, effective stress, phenomenon of quick sand
	3rd	Compaction and Consolidation
	4th	Light and heavy compaction test, optimum Moisture Content of soil, Maximum Dry density
7th	1st	zero air void line, Factors affectingCompaction, Field compaction methods and their suitability
	2nd	Field compaction methods and their suitability
	3rd	**Consolidation:**Consolidation, distinction between compaction and consolidation.
	4th	Terzaghi's model analogy of compression
8th	1st	springs showing the process of consolidation – field implications
	2nd	springs showing the process ofconsolidation – field implications

	3rd	**Shear Strength** 7.1 Concept of shear strength, Mohr- Coulomb failure theory, Cohesion, Angle ofinternal friction
	4th	strength envelope for different type of soil
9th	1st	Measurement of shearstrength;- Direct shear test
	2nd	triaxial shear test, unconfined compression test
	3rd	And vane-shear test
	4th	**Earth Pressure on Retaining Structures**
10th	1st	Active earth pressure, Passive earth pressure, Earth pressure at rest.
	2nd	Use of Rankine's formula for the following cases (cohesion-less soil only)
	3rd	(i) Backfill with no surcharge
	4th	(ii) backfill with uniform surcharge
11th	1st	**Foundation Engineering**
	2nd	Functions of foundations
	3rd	Functions of foundations
	4th	Functions of foundations
12th	1st	shallow and deep foundation
	2nd	shallow and deep foundation
	3rd	different type of shallowand deep foundations with sketches
	4th	Types of failure (General shear, Local shear & punching shear)
13th	1st	General shear
	2nd	Local shear
	3rd	punching shear
	4th	Bearing capacity of soil
14th	1st	bearing capacity of soils using Terzaghi's formulae
	2nd	ISCode formulae for strip
	3rd	Circular and square footings
	4th	Effect water table on bearing capacity of soil
15th	1st	Plate load test and standard penetration test
	2nd	PYQ Discussion
	3rd	PYQ Discussion
	4th	PYQ Discussion

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(PTGF, civil)

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LESSON PLAN OF 5TH SEMESTER(2023-24) CIVIL ENGINEERING

Discipline :- CIVIL	Semester:-5TH	Name of the Teaching Faculty:-INDU BHARATI MAHAPATRA (PTGF,CIVIL) GOVT. POLYTECHNIC, BERHAMPUR
Subject:- Estimating & Cost Evaluation-2	No of Days/per Week Class Allotted :-04	Semester From:- **1ST AUG,2023** To:-**30TH NOV,2023** No of Weeks:- **15**
Week	**Class Day**	**Theory Topics**
1st	1st	**Detailed estimate of culverts and bridges**
	2nd	Detailed estimate of a RCC slab culvert with right angledwing walls with barbending schedule.
	3rd	Detailed estimate of a RCC slab culvert with right angledwing walls with barbending schedule.
	4th	Detailed estimate of a RCC slab culvert with right angledwing walls with barbending schedule.
2nd	1st	RCC slab culvert with right angled wingwalls
	2nd	RCC slab culvert with right angled Wingwalls
	3rd	RCC slab culvert with right angled wingwalls
	4th	RCC slab culvert with right angled wingwalls
3rd	1st	RCC Hume pipe culvert with splayed angled wing wall
	2nd	RCC Hume pipe culvert with splayed angled wing wall
	3rd	RCC Hume pipe culvert with splayed angled wing wall
	4th	RCC Hume pipe culvert with splayed angled wing wall
4th	1st	**Estimate of irrigation structures**
	2nd	Detailed estimate of simple type of vertical fall to given specification
	3rd	Detailed estimate of simple type of vertical fall to given specification
	4th	Detailed estimate of simple type of vertical fall to given specification
5th	1st	Detailed estimate of drainage siphon to given specification.
	2nd	Detailed estimate of drainage siphon to given specification.
	3rd	Detailed estimate of drainage siphon to given specification.
	4th	Detailed estimate of drainage siphon to given specification.
6th	1st	**Detailed estimate of roads**
	2nd	Detail estimate of a water bound macadam road
	3rd	Detail estimate of a water bound macadam road
	4th	Detail estimate of a water bound macadam road
7th	1st	Detailed estimate of a flexible pavement in cutting / filling
	2nd	Detailed estimate of a flexible pavement in cutting / filling
	3rd	Detailed estimate of a flexible pavement in cutting / filling
	4th	Detailed estimate of a flexible pavement in cutting / filling
8th	1st	Detailed estimate of septic tank and soak pit for 50 users
	2nd	Detailed estimate of septic tank and soak pit for 50 users
	3rd	Detailed estimate of septic tank and soak pit for 50 users

	4th	Detailed estimate of septic tank and soak pit for 50 users
9th	1st	**Miscellaneous estimates**
	2nd	Tube well, Piles and Pile cap, Isolated and combined footings.
	3rd	Tube well, Piles and Pile cap, Isolated and combined footings.
	4th	Tube well, Piles and Pile cap, Isolated and combined footings.
10th	1st	**PWD Accounts works**
	2nd	Classification of work-original, major, petty, repair work, annual repair, special repair, quadrantal repair.
	3rd	Concept of Method of execution of works through the contractors and department
	4th	Concept of Method of execution of works through the contractors and department
11th	1st	work order, types of contract
	2nd	piece work agreement. Accounts of works
	3rd	piece work agreement. Accounts of works
	4th	Explanation of various terms
12th	1st	E-tendering, security deposit, advance payment, intermediate payment, final payment,
	2nd	running bill, final bill,regular and temporary establishment,cash,
	3rd	major & subhead of account,
	4th	temporary advance (imprest money)
13th	1st	Measurement book use & maintenance, procedure of marking entries of measurement of work and supply of materials, labour employed,standard measurement books and common irregularity
	2nd	Muster roll : Its preparation & use for making payment of pay& wages,Acquittance Roll
	3rd	Muster roll : Its preparation & use for making payment of pay& wages,Acquittance Roll
	4th	Its preparation & use for making payment of pay & wages Labour & labour report
14th	1st	Its preparation & use for making payment of pay & wages Labour & labour report
	2nd	Classification of stores, receipt / issue statement on standard form,
	3rd	Method of preparation of stock account
	4th	preparation and submission of returns, verification of stocks, shortage and excess
15th	1st	preparation and submission of returns, verification of stocks, shortage and excess
	2nd	Building BYLAWS and REGULATORY Bodies, Development authorities
	3rd	PYQ Discussion
	4th	PYQ Discussion

Indubharati Mahapatra
(PTGF, Civil)

Sandeep Marndy
01/08/2023
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LESSON PLAN RAILWAY & BRIDGE ENGINEERING
(Th.3)

Discipline: Civil Engineering	Semester: 5TH	Name of the Teaching Faculty: A.Guptewar Patra
Subject: RAILWAY & BRIDGE ENGINEERING	No. of days/ per week class allotted: 4	Semester From Date : 01/08/2023 To Date: 30/11/2023 No. of Weeks: 15
Week	Class Day	Theory/ Practical Topics
SECTION – A: RAILWAYS		
1st	1st	1.0 Introduction 1.1Railway terminology 1.2Advantages of railways
	2nd	1.3Classification of Indian Railways
	3rd	2.0 Permanent way 2.1 Definition and components of a permanent way
	4th	2.0 Permanent way 2.1 Definition and components of a permanent way
2nd	1st	2.0 Permanent way 2.1 Definition and components of a permanent way
	2nd	2.2 Concept of gauge, different gauges prevalent in India, suitability of these gauges under different conditions
	3rd	2.2 Concept of gauge, different gauges prevalent in India, suitability of these gauges under different conditions
	4th	2.2 Concept of gauge, different gauges prevalent in India, suitability of these gauges under different conditions
3rd	1st	3.0 Track materials 3.1 Rails 3.1.1 Functions and requirement of rails 3.1.2 Types of rail sections, length of rails
	2nd	3.1.3 Rail joints – types, requirement of an ideal joint 3.1.4 Purpose of welding of rails & its advantages 3.1.5 Creep definition, cause & prevention
	3rd	3.2 Sleepers 3.2.1 Definition, function & requirements of sleepers
	4th	3.2.2 Classification of sleepers 3.2.3 Advantages & disadvantages of different types of sleepers
4th	1st	3.3 Ballast 3.3.1 Functions & requirements of ballast 3.3.2 Materials for ballast
	2nd	3.4 Fixtures for Broad gauge 3.4.1 Connection of rails to rail-fishplate, fish bolts 3.4.2 Connection of rails to sleepers

	3rd	**4.0 Geometric for Broad gauge** 4.1 Typical cross – sections of single & double broad gauge railway track in cutting and embankment
	4th	4.0 Geometric for Broad gauge 4.1 Typical cross – sections of single & double broad gauge railway track in cutting and embankment
5th	1st	4.0 Geometric for Broad gauge 4.1 Typical cross – sections of single & double broad gauge railway track in cutting and embankment
	2nd	4.2 Permanent & temporary land width
	3rd	4.2 Permanent & temporary land width
	4th	4.3 Gradients for drainage
6th	1st	4.3 Gradients for drainage
	2nd	4.4 Super elevation – necessity & limiting valued
	3rd	4.4 Super elevation – necessity & limiting valued
	4th	4.4 Super elevation – necessity & limiting valued
7th	1st	**5.0 Points and crossings** 5.1 Definition, necessity of Points and crossings
	2nd	5.0 Points and crossings 5.1 Definition, necessity of Points and crossings
	3rd	5.0 Points and crossings 5.1 Definition, necessity of Points and crossings
	4th	5.2 Types of points & crossings with tie diagrams
8th	1st	5.2 Types of points & crossings with tie diagrams
	2nd	5.2 Types of points & crossings with tie diagrams
	3rd	**6.0 Laying & maintenance of track** 6.1 Methods of Laying & maintenance of track
	4th	6.0 Laying & maintenance of track 6.1 Methods of Laying & maintenance of track
9th	1st	6.0 Laying & maintenance of track 6.1 Methods of Laying & maintenance of track
	2nd	6.2 Details of a permanent way inspector
	3rd	6.2 Details of a permanent way inspector
	4th	6.2 Details of a permanent way inspector
		SECTION – B: BRIDGES
10th	1st	**7.0 Introductions** 7.1 Definitions 7.2 Components of a bridge
	2nd	7.3 Classification of bridges 7.4 Requirements of an ideal bridge
	3rd	**8.0 Bridge Site investigation, hydrology & planning** 8.1 Selection of bridge site
	4th	8.2 Bridge alignments 8.3 Determination of flood discharge
11th	1st	8.4 Waterway & economic span
	2nd	8.5 Afflux, clearance & free board

	3rd	8.6 Collection of bridge design data & sub surface investigation
	4th	**9.0 Bridge foundation** 9.1 Scour depth minimum depth of foundation
12th	1st	9.1 Scour depth minimum depth of foundation
	2nd	9.2 Types of bridge, foundations – spread foundation, pile foundation- pile driving, well foundation – sinking of wells, caission foundation
	3rd	9.2 Types of bridge, foundations – spread foundation, pile foundation- pile driving, well foundation – sinking of wells, caission foundation
	4th	9.2 Types of bridge, foundations – spread foundation, pile foundation- pile driving, well foundation – sinking of wells, caission foundation
13th	1st	9.2 Types of bridge, foundations – spread foundation, pile foundation- pile driving, well foundation – sinking of wells, caission foundation
	2nd	9.3 Coffer dams
	3rd	**10.0 Bridge substructure and approaches** 10.1 Types of piers
	4th	10.2 Types of abutments
14th	1st	10.2 Types of abutments
	2nd	10.3 Types of wing walls
	3rd	10.4 Approaches
	4th	**11.0 Permanent bridges** 11.1 Masonry bridges
15th	1st	11.2 Steel bridges – classification with sketches
	2nd	11.3 Concrete bridges – classification, brief description with sketches 11.4 IRC bridge loading
	3rd	**12.0 Culvert & cause ways** 12.1 Types of culvers - brief description
	4th	12.2 Types of causeways - brief description

A. Gupteswar Patro
P.T.G.F (CIVIL ENGG.)

Sandeep Marandy
01/08/2023
(Lect. Civil)

LESSON PLAN BUILDING MATERIAL AND CONSTRUCTION TECHNOLOGY (Th.3)

Discipline: Civil Engineering	Semester: 3rd	Name of the Teaching Faculty: **A.GUPTESWAR PARTA**
Subject: Th.3 Building materials & Construction Technology	No. of days/ per week class allotted: 5	Semester From Date : **01/08/2023** To Date: **30/11/2023** No. of Weeks: 15
Week	Class Day	Theory/ Practical Topics
		1.Stone
1st	1st	1.1 Classification of rock, uses of stone, natural bed of stone,
	2nd	1.2Qualities of good building stone,
	3rd	1.3 Dressing of stone
	4th	question answer discussion
	5th	1.4 Characteristics of different types of stone and their uses
2nd	1st	1.4 Characteristics of different types of stone and their uses
	2nd	**Brick** earth – its composition
	3rd	2.1Brick making – Preparation of brick earth
	4th	question answer discussion
	5th	3.2Brick making – Preparation of brick earth
3rd	1st	2.3Moulding, Drying, Burning in kilns (continuous Process)
	2nd	2.4Classification of bricks, size of traditional and modular bricks
	3rd	qualities of good building bricks
	4th	**3.1 Cement:** Types of cements, Properties of cements, Manufacturing of cement
	5th	3.2Importance and application of blended cement with fly ash and blast furnace slag.
4th	1st	question answer discussion
	2nd	3.3 Mortar: Definition and types of mortar
	3rd	3.4 Sources and classification of sand, Bulking of sand
	4th	3.5 Use of gravel, morrum and fly ash as different building material
	5th	question answer discussion
5th	1st	3.6Concrete: Definition and composition- Water cement ratio- Workability, mechanical properties and grading of aggregates,
	2nd	mixing, placing, compacting and curing of concrete.
	3rd	question answer discussion
	4th	**4.1 Timber**: Classification and Structure of timber.
	5th	4.2 Seasoning of timber – Importance.

6th	1st	4.3 Characteristics of good timber.
	2nd	4.3 Clay products and refractory materials – Definition and Classification.
	3rd	question answer discussion
	4th	4.4 Properties and uses of refractory materials- tiles, terracotta, porcelain glazing
	5th	4.5 Iron and Steel: Uses of cast iron, wrought iron, mild steel and tor steel
7th	1st	**5.1 Composition of Paints**, enamels, varnishes.
	2nd	5.2 Types and uses of surface protective materials like Paints
	3rd	question answer discussion
	4th	5.2 Types and uses of surface protective materials like Paints
	5th	Enamels, Varnishes, Distempers, Emulsion, French polish and Wax Polish.
8th	1st	Enamels, Varnishes, Distempers, Emulsion, French polish and Wax Polish.
	2nd	**BUILDING CONSTRUCTION**
		1.1 Buildings and classification of buildings based on occupancy
	3rd	1.2 Different components of a building.
	4th	1.3 Site investigation – objectives, site reconnaissance and explorations.
	5th	question answer discussion
9th	1st	2.1 Concept of foundation and its purpose 2.2 Types of foundations – shallow and deep
	2nd	2.3 Shallow foundation-constructional details of : Spread foundations for walls, thumb rules for depth and width of foundation and thickness of concrete block
	3rd	2.4 Deep foundations: Pile foundations-their suitability
	4th	classification of piles based on materials, function and method of installation.
	5th	3.1 Purpose of walls 3.2 Classification of walls – load bearing, non-load bearing walls, retaining walls.
10th	1st	3.3 Classification of walls as per materials of construction: brick, stone, reinforced brick, reinforced concrete, precast, hollow and solid concrete block and composite masonry walls (Concept Only).
	2nd	question answer discussion
	3rd	3.4 Partition Walls : Suitability and uses of brick and wooden partition walls

	4th	3.5 Brick masonry : Definition of different terms 3.6 Bond – meaning and necessity: English bond for 1and 1-1/2 Brick thick walls. T, X and right angled corner junctions. Thickness for 1and 1-1/2 brick square pillars in English bond
	5th	3.7 Stone Masonry :
11th	1st	3.8 Glossary of terms –String course, corbel, cornice, block-in-course, grouting, mouldings, templates, throating, through stones, parapet, coping, pilaster and buttress
	2nd	question answer discussion
	3rd	4.1 Glossary of terms used in doors and windows
	4th	4.2 Doors – different types of doors
	5th	4.3 Windows – different types of windows
12th	1st	4.4 Purpose of use of arches and lintels
	2nd	5.1 Floors: Glossary of terms ,Types of floor finishes – cast-in-situ, concrete flooring(monolithic, bonded), terrazzo tile flooring, cast in situ Terrazzo flooring, timber flooring (Concept only)
	3rd	5.2 Roofs: Glossary of terms, Types of roofs, concept and function of flat, pitched, hipped and Sloped roofs
	4th	question answer discussion
	5th	5.3 Stairs: Glossary of terms; Stair case, winder, landing, stringer, newel, baluster, rise, tread, width of stair case, hand rail, nosing, head room, mumty room.
13th	1st	5.4 Various types of stair case – straight flight, dog legged, open well, quarter turn
	2nd	half turn (newel and geometrical stairs), bifurcated stair, spiral stair, cantilever stair, tread riser stair.
	3rd	6.1 Plastering – purpose – Types of plastering, Types of plaster finishes – Grit finish, rough cast, smooth cast, sand faced, pebble dash, acoustic plastering and plain plaster etc.
	4th	6.2 Proportion of mortars used for different plasters, preparation of mortars, techniques of plastering and curing 6.3 Pointing – purpose –Types of pointing
	5th	question answer discussion
14th	1st	6.4 Painting – objectives – method of painting new and old wall surfaces, wood surface and metal surfaces – powder coating and spray painting on metal surfaces.
	2nd	6.5 White washing – Colour washing – Distempering – internal and external walls.
	3rd	6.6 Damp and Termite proofing – Materials and Methods.

	4th	8.1 Concept of green building 8.2 Introduction to Energy Management and Energy Audit of Buildings.
	5th	question answer discussion
15th	1st	8.3 Aims of energy management of buildings.
	2nd	8.4 Types of energy audit, Response energy audit questionnaire
	3rd	question answer discussion
	4th	8.5 Energy surveying and audit report.
	5th	question answer discussion

A. Guptesswar Patro
P.T.G.F (CIVIL ENGG.)

Sandeep Mamidy
01/08/2023
(Lect. (Civil)

Discipline : Civil Engineering	Semester : 3RD	Name of the Teaching Faculty: TEJASWINI GOUDA
Subject :- Estimation & Cost Evaluation – I	No. of Days/ per week class allotted: 4	Semester From Date: 01/08/2023 To Date 30/11/2023 No. of Weeks: 15
Week	**Class Day**	**Theory Topics**
1st	1st	**CHAPTER 1** 1.1. Types of estimates – Plinth area, floor area / carpet area 1.2. Units and modes of measurements as per IS 1200
	2nd	1.3. Accuracy of measurement for different item of work
	3rd	**CHAPTER 2** 2.1. Short wall long wall method
	4th	Centre line method, deductions in masonry
2nd	1st	Plastering, white washing, painting etc
	2nd	Multiplying factor (paint coefficients) for painting of doors and windows (paneled/glazed), grills etc.
	3rd	Multiplying factor (paint coefficients) for painting of doors and windows (paneled/glazed), grills etc.
	4th	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.
3rd	1st	Detailed estimate of single storied Building by Short wall long wall method
	2nd	Detailed estimate of single storied Building by Short wall long wall method
	3rd	Detailed estimate of single storied Building by Short wall long wall method
	4th	Detailed estimate of single storied Building by Short wall long wall method
4th	1st	Detailed estimate of single storied Building by Short wall long wall method
	2nd	Detailed estimate of single storied Building by Short wall long wall method
	3rd	Detailed estimate of single storied Building by Short wall long wall method
	4th	Detailed estimate of single storied Building by Short wall long wall method
5th	1st	Detailed estimate of single storied Building by Short wall long wall method
	2nd	Detailed estimate of single storied Building by Short wall long wall method
	3rd	Detailed estimate of single storied Building by Short wall long wall method
	4th	Detailed estimate of single storied Building by Short wall long wall method

6th	1st	Detailed estimate of single storied Building by Centre line method
	2nd	Detailed estimate of single storied Building by Centre line method
	3rd	Detailed estimate of single storied Building by Centre line method
	4th	Detailed estimate of single storied Building by Centre line method
7th	1st	Detailed estimate of single storied Building by Centre line method
	2nd	Detailed estimate of single storied Building by Centre line method
	3rd	Detailed estimate of single storied Building by Centre line method
	4th	Detailed estimate of single storied Building by Centre line method
8th	1st	Detailed estimate of single storied Building by Centre line method
	2nd	Detailed estimate of single storied Building by Centre line method
	3rd	Detailed estimate of single storied Building by Centre line method
	4th	Detailed estimate of single storied Building by Centre line method

SIGNATURE OF FACULTY

Sandeep Maurya
01/08/2023
Lect. Civil

Discipline : **Civil Engineering**	Semester : **5TH**	Name of the Teaching Faculty: **TEJASWINI GOUDA**
Subject :- **Structural Design II**	No. of Days/ per week class allotted: **4**	Semester From Date: **01/08/A2023 To Date 30/11/2023** No. of Weeks: **15**
Week	**Class Day**	**Theory Topics**
1st	1st	**CHAPTER 1** 1.1 Common steel structures, Advantages & disadvantages of steel structures. 1.2 Types of steel, properties of structural steel.
	2nd	1.3 Rolled steel sections, special considerations in steel design.
	3rd	1.4 Loads and load combinations.
	4th	1.5 Structural analysis and design philosophy.
2nd	1st	1.6 Brief review of Principles of Limit State design.
	2nd	**CHAPTER 2** 2.1 Bolted Connections 2.1.1 Classification of bolts, advantages and disadvantages of bolted connections 2.1.2 Different terminology, spacing and edge distance of bolt holes.
	3rd	2.1.3 Types of bolted connections.
	4th	2.1.4 Types of action of fasteners, assumptions and principles of design.
3rd	1st	2.1.5 Strength of plates in a joint, strength of bearing type bolts (shear capacity& bearing capacity), reduction factors, and shear capacity of HSFG bolts.
	2nd	2.1.6 Analysis & design of Joints using bearing type and HSFG bolts (except eccentric load and prying forces)
	3rd	2.1.7 Efficiency of a joint.
	4th	2.2 Welded Connections: 2.2.1 Advantages and Disadvantages of welded connection
4th	1st	2.2.2 Types of welded joints and specifications for welding
	2nd	2.2.3 Design stresses in welds.
	3rd	2.2.4 Strength of welded joints.
	4th	**CHAPTER 3** 3.1 Common shapes of tension members.
5th	1st	
	2nd	3.2 Maximum values of effective slenderness ratio.
	3rd	
	4th	3.4 Analysis of tension members.(Considering strength only and concept of block shear failure.)
6th	1st	
	2nd	3.4 Analysis of tension members.(Considering strength only and concept of block shear failure.)
	3rd	Design of tension members.(Considering strength only and concept of block shear failure.)

	4th	Design of tension members.(Considering strength only and concept of block shear failure.)
7th	1st	Design of tension members.(Considering strength only and concept of block shear failure.)
	2nd	**CHAPTER 4** 4.1 Common shapes of compression members.
	3rd	**CHAPTER 4** 4.1 Common shapes of compression members.
	4th	4.2 Buckling class of cross sections, slenderness ratio
8th	1st	4.2 Buckling class of cross sections, slenderness ratio
	2nd	4.3 Design compressive stress and strength of compression members.
	3rd	4.3 Design compressive stress and strength of compression members.
	4th	4.3 Design compressive stress and strength of compression members.
9th	1st	4.4 Analysis of compression members (axial load only).
	2nd	Design of compression members (axial load only).
	3rd	Design of compression members (axial load only).
	4th	**CHAPTER 5** 5.1 Common cross sections and their classification.
10th	1st	5.1 Common cross sections and their classification.
	2nd	5.2 Deflection limits, web buckling and web crippling.
	3rd	5.2 Deflection limits, web buckling and web crippling.
	4th	5.2 Deflection limits, web buckling and web crippling.
11th	1st	5.3 Design of laterally supported beams against bending and shear.
	2nd	5.3 Design of laterally supported beams against bending and shear.
	3rd	5.3 Design of laterally supported beams against bending and shear.
	4th	5.3 Design of laterally supported beams against bending and shear.
12th	1st	5.3 Design of laterally supported beams against bending and shear.
	2nd	**CHAPTER 6** 6.1 Round Tubular Sections, Permissible Stresses
	3rd	Problem Practice
	4th	6.2 Tubular Compression & Tension Members
13th	1st	Problem Practice
	2nd	6.3 Joints in Tubular trusses
	3rd	Problem Practice
	4th	**CHAPTER 7** 7.1 Design considerations for Masonry walls & Columns
14th	1st	7.1 Design considerations for Masonry walls & Columns

	2nd	7.1 Design considerations for Masonry walls & Columns
	3rd	Load Bearing & Non-Load Bearing walls
	4th	Load Bearing & Non-Load Bearing walls
15th	1st	Load Bearing & Non-Load Bearing walls
	2nd	Permissible stresses, Slenderness Ratio
	3rd	Permissible stresses, Slenderness Ratio
	4th	Permissible stresses, Slenderness Ratio

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Sandeep Maanuly
01/08/2023
Lect. Civil