Discipline:**CIVIL**	Semester: **4th**	Name of Teaching Faculty:-**TAPAS KUMAR MALLICK**
Subject:- **Land Survey-I**	No of Days/Week Class alloted:- **05**	Semester from date: 14.02.2023 to 23.05.23 No of Weeks: **15**
Week	Claas Day	Theory Topics
1st	1st	**1.Introduction to Surveying ,Linear measurements:**-Definitions,Aim and objectives.
	2nd	Principles of Survwey.
	3rd	Precisions and accuracy of measurements.
	4th	Types of tapes and chains.
	5th	Errors and mistakes in linear measurements.
2nd	1st	Corrections to measured due to incorrect length,sag,pull,temp.variation.
	2nd	Numerical problems.
	3rd	**2.Chaining and Chain Surveying:-** Equipment accessories for chaining.
	4th	Ranging- ,Line ranger,Errors due to incorrect ranging.
	5th	Methods of chaining,Clinometer
3rd	1st	Setting perpendicularswith chain &tape,Chaining across different obstacles.
	2nd	Purpose of chain surveying,Concept of field book.
	3rd	Offsets,Instruments for setting offsets.
	4th	Errors in chain surveying.
	5th	**3.Angular measurement and compass surveying:-** Measurement of angle with chain,tape and compass.
4th	1st	Compass-Types,features
	2nd	Compass-Merits,Demerits,Testing and adjustment of compass.
	3rd	Designation of angles,concept of bearing
	4th	Numerical problems on bearings
	5th	Use of compass,FB,BB,Numerical problems
5th	1st	Effects of earth magnetism,numericals problems on declination
	2nd	Errors in angle measurement with compass
	3rd	Principals of traversing
	4th	Local attractions-causes ,detections & corrections and numericals.
	5th	Errors in compass surveying
6th	1st	Plotting of traversing
	2nd	**4.Map reading cadastrin maps and nomenclature:-**study of direction,scale
	3rd	study of signs and symbols
	4th	Cadstral map preparartions
	5th	Unique identification of number of parcel
7th	1st	Control points and its types
	2nd	Adjecent boundaries and features
	3rd	Topology creations and veryfication
	4th	**5.plane table surveying:-**Objectives,principles and use
	5th	Instruments and accessories
8th	1st	Methods-Radations,intersection
	2nd	Traversing, resection method
	3rd	Two point problem

	4th	Three point problem
	5th	Errors in plane table surveying
9th	1st	**6:-Theodolite surveying and traversing:**-Purpose and definition
	2nd	Transit theodolite -Features, parts
	3rd	Fundamental axes of theodolite,temporary adjustment
	4th	Concept of transiting,measurement of horizontal and vertical angle
	5th	Measurement of magnetic bearings,deflection angles
10th	1st	Setting out angles
	2nd	Errors in theodolite
	3rd	Methods of theodolite traversing
	4th	Checks for open and closed travers
	5th	Travers computation
11th	1st	Numericals problems
	2nd	Closing errors
	3rd	Adjustment bearings and numerical problems
	4th	Balancing of traverse
	5th	Calculation of areas
12th	1st	**7. Levelling and contouring:**-Definition purpose and types
	2nd	Essential features and use of different leveling instruments ,concept of
	3rd	Leveling staff-types,features and use,temporary and perment adjustmment
	4th	Concept of BS,IS,FS,CP,HI,Principle of leveling
	5th	Field data entry,HI and Rise and fall method,numerical problems
13th	1st	Dfferent types of leveling,uses and methods,plotting of profiles
	2nd	Curvature and refraction,reciprocal leveling
	3rd	Diffculties in leveling,errors ,sensitiveness of bubble tube,setting grades
	4th	**CONTOURIN**G-Definations,concept and characteristics
	5th	Methods of contouring
14th	1st	Plotting contour maps
	2nd	Interpolation of contour maps
	3rd	Use of contour maps
	4th	Computation of volume from contour map
	5th	Interpet physical land form,problem solving and decision making
15th	1st	**8.Computation of area and volume:-**Area from plans
	2nd	Oridinate rule, trapizodial rule,numerical problems
	3rd	Simpson's rule and numericals
	4th	Calculation of volume by different methods
	5th	Numerical problems

13/12/22

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LESSON PLAN OF 4TH SEMESTER CIVIL ENGINEERING

Discipline :- CIVIL	Semester:- 4TH	Name of the Teaching Faculty:- Mr.SWAYAN RANJAN MISRA
Subject:- Structural Design-1	No of Days/per Week Class Allotted :- 05	Semester From:- **14.02.2023** To:- **23.05.2023** No of Weeks:- **16**

Week	Class Day	Theory Topics
1st	1st	**1.1 Working stress method (WSM)** 1.2 Objectives of design and detailing.
	2nd	State the different methods of design of concrete structures.
	3rd	1.2Introduction to reinforced concrete, R.C. sections their behavior, grades of concrete
	4th	and steel Permissible stresses, assumption in WSM & LSM
	5th	1.3Basic concept of under reinforced, over reinforced and balanced section
2nd	1st	1.4flexural design & analysis of singly and doubly reinforced rectangular sections.(WSM)
	2nd	Numerical problems on Balanced section
	3rd	Numerical problems on Balanced section
	4th	Numerical problems on under reinforced section
	5th	Numerical problems on under reinforced section
3rd	1st	Numerical problems on over reinforced section
	2nd	**2.1 Limit state method (LSM)** Introduction
	3rd	2.1Definition, types of limit states, partial safety factors for materials strength.
	4th	Characteristic load, design load, loading on structure 2.2 I.S specification regarding spacing of reinforcement in slab,
	5th	Cover to reinforcement in slab Beam column & footing, minimum reinforcement ir slab.
4th	1st	Beam & column, lapping, anchorage
	2nd	Effective span for beam & slab.
	3rd	**3.0Analysis and design of singly reinforced sections (LSM)** 3.1 Limit state of collapse (flexure), Assumptions, Stress-Strain relationship for concrete and steel, neutral axis.
	4th	Stress block diagram and strain diagram for singly reinforced section.
	5th	3.2 Concept of under- reinforced, over-reinforced and limiting section
5th	1st	Neutral axis co-efficient,
	2nd	Limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section.
	3rd	Numerical problems on determining design constants
	4th	Numerical problems on determining design constants
	5th	Numerical problems on determining design constants
6th	1st	Moment of resistance and area of steel for rectangular sections.
	2nd	Numerical problems on Moment of Resistance.
	3rd	**4.1 Analysis and design of doubly reinforced section (LSM)** 4.1General features, necessity of providing doubly reinforced section, reinforcement

		limitations
	4th	4.2Analysis of doubly reinforced section, strain diagram, stress diagram, depth of neutral axis
	5th	Moment of resistance of the rectangular section.
7th	1st	4.3Numerical problems on finding moment of resistance and design of beam sections.
	2nd	Numerical problems
	3rd	Numerical problems
	4th	**5.1 Shear, Bond and Development Length (LSM)** 5.2 Nominal shear stress in R.C. section, design shear strength of concrete maximum shear stress,
	5th	Design of shear reinforcement, minimum shear reinforcement, forms of shear reinforcement.
8th	1st	5.3 Bond and types of bond, bond stress, check for bond stress, development length in tension and compression,
	2nd	Anchorage value for hooks 90^0 bend and 45^0 bend standards lapping of bars check for development length.
	3rd	5.3Numerical problems on deciding whether shear reinforcement are required or not, check for adequacy of the section in shear. Design of shear reinforcement;
	4th	Minimum shear reinforcement in beams; Determination of Development length required for tension reinforcement of cantilevers beam and slab, check for development length.
	5th	**6.1 Analysis and Design of T-Beam (LSM)** 6.2 General features, advantages, effective width of flange as per IS: 456-2000 code provisions.
9th	1st	6.2Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis
	2nd	Moment of resistance of T-beam section with neutral axis lying within the flange.
	3rd	6.3Design of T-beam for moment and shear for neutral axis within or up to flange bottom
	4th	6.4Simple numerical problems on deciding effective flange width.
	5th	Problems on finding moment of resistance of T-beam section when N.A. lies within or up to the bottom of flange
10th	1st	Simple numerical problems
	2nd	Simple numerical problems
	3rd	**7.1 Design of Slab and Stair case (LSM)** 7.1Design of simply supported one-way slabs for flexure
	4th	Check for deflection control and shear.
	5th	7.2Design of one-way cantilever slabs for flexure
11th	1st	Check for deflection control and check for development length and shear.
	2nd	Design of cantilevers chajjas for flexure
	3rd	Check for deflection control and check for development length and shear.
	4th	Simple numerical problems on design of one-way simply supported slabs
	5th	Simple numerical problems on design of cantilever slab
12th	1st	7.3Design of two-way simply supported slabs for flexure with corner free to lift
	2nd	Simple numerical problems on design of two-way simply supported slab
	3rd	7.4Design of dog-legged staircase
	4th	Simple numerical problems on dog-legged staircase
	5th	Design of cantilever staircase.
13th	1st	Simple numerical problems on cantilever staircase

	2nd	**8.0Design of Axially loaded columns and Footings (LSM)** 8.1Assumptions in limit state of collapse- compression. 8.2Definition and classification of columns
	3rd	Length of column. Specification for minimum reinforcement; cover, maximum reinforcement
	4th	Number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties.
	5th	8.3Analysis and design of axially loaded short column with lateral ties only
14th	1st	Analysis and design of axially loaded square column with lateral ties only
	2nd	check for short column and check for minimum eccentricity
	3rd	Analysis and design of axially loaded rectangular columns with lateral ties only
	4th	Analysis and design of axially loaded circular with lateral ties only
	5th	8.4Types of footing
15th	1st	Design of isolated square column footing for flexure and shear
	2nd	Design of Strip footing for walls.
	3rd	8.5Simple numerical problems on axially loaded short columns
	4th	Simple numerical problems on isolated footings.
	5th	Simple numerical problems on wall footings.
16th	1st	**DOUBT CLEARING CLASS AND REVISION & PREVIOUS FIVE YEARS QUESTION ANSWER DISCUSSION**
	2nd	
	3rd	
	4th	
	5th	

13-02-23

13/02/23

LESSON PLAN OF 4th SEMESTER CIVIL ENGINEERING

Discipline :- CIVIL	Semester:- 4th	Name of the Teaching Faculty:- TAPAS RANJAN MISHRA
Subject:- Hydraulics & Irrigation Engg.	No of Days/per Week Class Allotted :- 05	Semester From:- **14.02.2023** To:- **23.05.2023** No of Weeks:- **16**

Week	Class Day	Theory Topics
1st	1st	**HYDROSTATICS** **Properties of fluid** density, specific gravity, surface tension,
	2nd	capillarity, viscosity and their uses
	3rd	**Pressure and its measurements:** intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure
	4th	relationship between atmospheric pressure
	5th	absolute pressure and gauge pressure; pressure Head; pressure gauges.
2nd	1st	**Pressure exerted on an immersed surface:** Total pressure
	2nd	Resultant pressure,
	3rd	Expression for total pressure exerted on horizontal
	4th	Example and Numerical Problem
	5th	Expression for total pressure vertical surface
3rd	1st	Example and Numerical Problem
	2nd	**KINEMATICS OF FLUID FLOW:** **Basic equation of fluid flow and their application** Rate of discharge, equation of continuity of liquid
	3rd	total energy of a liquid in motion- potential, Kinetic & pressure,.
	4th	Bernoulli's theorem and its limitations
	5th	Practical applications of Bernoulli's equation
4th	1st	**Flow over Notches and Weirs** Notches, Weirs, types of notches and weirs
	2nd	Discharge through different types of notches and weirs-their application
	3rd	**Types of flow through the pipes** uniform and non uniform
	4th	laminar and turbulent
	5th	steady and unsteady
5th	1st	Reynolds's number and its application
	2nd	**Losses of head of a liquid flowing through pipes** Different types of major and minor losses
	3rd	Simple numerical problems on losses due to friction using

		Darcy's equation
	4th	Total energy lines & hydraulic gradient lines
	5th	Types of channel sections-rectangular, trapezoidal and circular section
6th	1st	Simple Numerical
	2nd	discharge formulae- Chezy's and Manning's equation
	3rd	Best economical section.
	4th	Simple Numerical
	5th	**PUMPS:** Type of pumps
7th	1st	**Centrifugal pump:** basic principles, operation, discharge.
	2nd	horse power & efficiency. Of Centrifugal pump
	3rd	**Reciprocating pumps:** types, operation, discharge
	4th	horse power & efficiency of Reciprocating pump
	5th	**Hydrology** Hydrology Cycle
8th	1st	Rainfall: types, intensity, hyetograph
	2nd	Estimation of rainfall, rain gauges, Its types
	3rd	Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae
	4th	**Water Requirement of Crops** Definition of irrigation, necessity, benefits of irrigation, types of irrigation
	5th	Crop season
9th	1st	Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops
	2nd	Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio
	3rd	**FLOW IRRIGATION** 3.1 Canal irrigation, types of canals, loss of water in canals
	4th	Perennial irrigation
	5th	Different components of irrigation canals and their functions
10th	1st	Different components of irrigation canals and their functions
	2nd	Sketches of different canal cross-sections
	3rd	Classification of canals according to their alignment
	4th	Various types of canal lining – Advantages and disadvantages
	5th	**WATER LOGGING AND DRAINAGE** Causes and effects of water logging, detection
11th	1st	prevention and remedies
	2nd	**DIVERSION HEAD WORKS AND REGULATORY STRUCTURES** Necessity and objectives of diversion head works
	3rd	weirs and barrages
	4th	General layout, functions of different parts of barrage
	5th	functions of different parts of barrage
12th	1st	Silting and scouring
	2nd	Functions of regulatory structures
	3rd	Functions of regulatory structures
	4th	**CROSS DRAINAGE WORKS** Functions and necessity of Cross drainage works
	5th	Functions and necessity of Cross drainage works
13th	1st	Concept of Aqueduct with help of neat sketch
	2nd	Concept of Aqueduct with help of neat sketch
	3rd	Concept of siphon with help of neat sketch reinforcement

	4th	Concept of siphon with help of neat sketch
	5th	Concept of super passage with help of neat sketch
14th	1st	Concept of Super Passage with help of neat sketch
	2nd	Concept of Level Crossing with help of neat sketch
	3rd	Concept of Level Crossing with help of neat sketch
	4th	**DAMS** Necessity of storage reservoirs
	5th	types of dams
15th	1st	Earthen dams: types, description
	2nd	causes of failure and protection measures of Earthen Dam
	3rd	Gravity dam- types, description
	4th	Causes of failure and protection measures.
	5th	Spillways- Types (With Sketch) and necessity
16th	1st	**DOUBT CLEARING CLASS AND REVISION & PREVIOUS FIVE YEARS QUESTION ANSWER DISCUSSION**
	2nd	
	3rd	
	4th	
	5th	

13/2/23

13/2/23

LESSON PLAN OF 4TH SEMESTER CIVIL ENGINEERING

Discipline:**CIVIL**	Semester: **4th**	Name of Teaching Faculty:-SIDHANTA MOHANTY
Subject:-HIGHWAY ENGINEERING	No of Days/Week Class alloted:-**05**	Semester from date: **14.02.2023 to 23.05.2023** No of Weeks: **15**
Week	Claas Day	Theory Topics
1st	1st	INTRODUCTION : Importance of highway transportation: importance
	2nd	central road research institute
	3rd	Function of indian roads congress
	4th	IRC classification of roads
	5th	Organisation of state highway department.
2nd	1st	Glossary of terms used in geometric and their
	2nd	right of way , formation width
	3rd	**road margin**
	4th	road shoulders
	5th	carriage way
3rd	1st	side slopes
	2nd	kerbs
	3rd	formation level
	4th	camber
	5th	**gradients**
4th	1st	Design and average running speed
	2nd	stopping and passing sight distance
	3rd	Nessesity of curves
	4th	horizontal and vertical curve
	5th	transition curve and
5th	1st	super elevation
	2nd	super elevation
	3rd	methods of providing super elevation
	4th	methods of providing super elevation
	5th	methods of providing super elevation
6th	1st	ROAD MATERIALS:Different type of road materials in use:soil , aggregate and binders
	2nd	Function of the soil , as highway subgrade
	3rd	Function of the soil , as highway subgrade
	4th	California bearing ratio :method of finding CBR valued in the labrotories and a site
	5th	and their significance
7th	1st	Testing aggregates: Abration test , crushing test
	2nd	water absorption test
	3rd	soundness test
	4th	soundness test
	5th	ROAD PAVEMENTS: Flexible and rigid pavments, their merits and demarits

8th	1st	typical cross sections ,functions of varies components, flexible pavments
	2nd	sub grade preparations : setting out alinments of road , setting out bench mark , control page for embakment and cutting , borrow pit, making profil of embakment
	3rd	construction of embakment , compaction , stabilization, preparation of sub grade , method of checking chamber, gradient and alignment as per recomandations
	4th	equipment used for subgrade preparation.
	5th	sub base course : stabilization sub base course , purpose of stabilization,
9th	1st	mechanical stabilization ,lime stabilization
	2nd	cenment stabilization ,fly ash stabilization
	3rd	surfacing : surface dressing : premix carpet , semi dence carpet
	4th	bituminous concrete ,grouting
	5th	base course : preparetion of base course , brick soiling ,stone soling ,metalling ,water bound macadam and wet mix macadam, bitumineous construction : different types.
10th	1st	rigid pavement : concept of concrete roads as per IRC specifiacations.
	2nd	rigid pavement : concept of concrete roads as per IRC specifiacations.
	3rd	HILL ROADS : intoduction : typical cross section showing all details of a typical hill roads in cut
	4th	partly in cutting
	5th	partly in filling
11th	1st	Breast wall
	2nd	retaining wall
	3rd	different types of bends
	4th	different types of bends
	5th	ROAD DRAINAGE :Necessity of road drainage work ,cross drainagr work.
12th	1st	surface and sub surface drain and stoms water drains ,location ,spacing , and typical details of side drains ,
	2nd	intercepting drains
	3rd	pipe drains in hill roads
	4th	details of drains in cutting embankment
	5th	typical cross section
13th	1st	typical cross section of road drains
	2nd	ROAD MAINTENANCE: Common type of road failures -their cause and remaids ,
	3rd	Maintenance of bitumineous road such as patch work and resurfacing
	4th	maintenance of concrete roads - filling cracks
	5th	repairing joints, maintenance of shoulders (berm)

14th	1st	maintenance of traffic control devices
	2nd	basic concept of traffic study,
	3rd	traffic sefty and trafic control signals
	4th	CONSTRUCTION EQUIPMENT: Preliminary ideas of the following plant and equipment : hot mix plant ,tipper ,trctors ,scaper, bulldozer, dumper ,shovels,graders ,roller dragline
	5th	asphalt mixer
15th	1st	tar boiler
	2nd	road paver
	3rd	morden road constuction equipment for roads
	4th	hot mixer
	5th	morden road constuction equipment for roads.

Sidhanta Mohanty
21/2/23

21/02/23