

Discipline-Civil Engineering	Semestar- 4th	Name Of the teaching Faculty: Er.Manoranjan Nayak & Diptirani Mishra
Subject-Hydraulics & Irrigation engineering	No. of Days/per week class allotted:5	Semestar From Date : 10/3/2022 To Date:10/6/2022
Week	Class Day	No. Of Weeks:
		Theory/Practical Topics
1st	1st	Density, specific gravity of Fluid and Problem
	2nd	Surface tension, capillarity
	3rd	Viscosity and their uses
	4th	Intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure
	5th	Relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head
2nd	1st	Relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head
	2nd	Pressure gauges.
	3rd	Pressure gauges.
	4th	Pressure gauges.
	5th	Total pressure, resultant pressure
3rd	1st	Expression for total pressure exerted on horizontal surface
	2nd	Expression for total pressure exerted on vertical surface
	3rd	Rate of discharge, equation of continuity of liquid flow
	4th	Rate of discharge, equation of continuity of liquid flow
	5th	kinetic & pressure, Bernoulli's theorem and its limitations
4th	1st	Practical applications of Bernoulli's equation
	2nd	Practical applications of Bernoulli's equation
	3rd	Practical applications of Bernoulli's equation
	4th	Notches, Weirs, types of notches and weirs
	5th	Discharge through different types of notches
5th	1st	Discharge through different types of weirs
	2nd	Uniform and non uniform; laminar and turbulent; steady and unsteady
	3rd	Reynold's number and its application
	4th	Different types of major and minor losses
	5th	Different types of major and minor losses
6th	1st	

	2nd	Simple numerical problems on losses due to friction using Darcy's equation
	3rd	Total energy lines & hydraulic gradient lines
	4th	Types of channel sections-rectangular, trapezoidal and circular
	5th	Types of channel sections-rectangular, trapezoidal and circular
7th	1st	Discharge formulae- Chezy's and Manning's equation
	2nd	Best economical section
	3rd	Best economical section
	4th	Centrifugal pump: basic principles, operation, discharge, horse power & efficiency
	5th	Reciprocating pumps: types, operation, discharge, horse power & efficiency
8th	1st	Hydrology Cycle
	2nd	Rainfall: types, intensity, hyetograph
	3rd	Estimation of rainfall, rain gauges, its types
	4th	Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae
	5th	Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae
9th	1st	Definition of irrigation, necessity, benefits of irrigation
	2nd	Types of irrigation, Crop season
	3rd	Duty, Delta and base period their relationship
	4th	overlap allowance, kharif and rabi crops
	5th	Gross command area, culturable command area, Intensity of Irrigation, Irrigable area, time factor, crop ratio
10th	1st	Gross command area, culturable command area, Intensity of Irrigation, Irrigable area, time factor, crop ratio
	2nd	Canal Irrigation, types of canals, loss of water in canal
	3rd	Canal Irrigation, types of canals, loss of water in canal
	4th	Different components of irrigation canals and their functions , Sketches of different canal cross-sections
	5th	Different components of irrigation canals and their functions , Sketches of different canal cross-sections

1th	1st	Classification of canals according to their alignment Various types of canal lining – Advantages and disadvantages
	2nd	Classification of canals according to their alignment Various types of canal lining – Advantages and disadvantages
	3rd	Causes and effects of water logging, detection, prevention and remedies
	4th	Causes and effects of water logging, detection, prevention and remedies
	5th	
12th	1st	Necessity and objectives of diversion head works weirs and barrages
	2nd	General layout, functions of different parts of barrage
	3rd	General layout, functions of different parts of barrage
	4th	Silting and scouring ,Functions of regulatory structures
	5th	Functions and necessity of Cross drainage works - aqueduct, siphon, superpassage, level crossing
13th	1st	Functions and necessity of Cross drainage works - aqueduct, siphon, superpassage, level crossing
	2nd	Functions and necessity of Cross drainage works - aqueduct, siphon
	3rd	Superpassage, level crossing
	4th	Necessity of storage reservoirs, types of dams
	5th	Earthen dams: types, description, causes of failure and protection measures
14th	1st	Gravity dam- types, description, Causes of failure and protection measures
	2nd	Gravity dam- types, description, Causes of failure and protection measures
	3rd	Gravity dam- types, description, Causes of failure and protection measures
	4th	Spillways- Types (With Sketch) and necessity
	5th	Spillways- Types (With Sketch) and necessity

Discipline-Civil Engineering	Semestar- 4th	Name Of the teaching Faculty: Er.Narasingsh Mohanty
Subject-Land survey-I	No. of Days/per week class allotted:5	Semestar From Date : 10/03/2022 To Date:10/06/2022
		No. Of Weeks: 14
Week	Class Day	Theory/Practical Topics
1st	1st	Surveying: Definition, Aims and objectives
	2nd	Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying.
	3rd	Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains.
	4th	Errors and mistakes in linear measurement – classification, Sources of errors and remedies.
	5th	Corrections to measured lengths due to-incorrect length, emperature variation, pull, sag, numerical problem applying corrections.
2nd	1st	Equipment and accessories for chaining
	2nd	Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging.
	3rd	Methods of chaining –Chaining on flat ground,
	4th	Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction
	5th	Setting perpendicular with chain & tape,
3rd	1st	Chaining across different types of obstacles –Numerical problems on chaining across obstacles.
	2nd	Purpose of chain surveying, Its Principles, concept of field book.
	3rd	Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines.
	4th	Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square.
	5th	Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying.
4th	1st	Measurement of angles with chain, tape & compass
	2nd	Compass – Types, features, parts, merits & demerits, testing & adjustment of compass
	3rd	Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing,
	4th	Quadrantal bearing, Reduced bearing, suitability of application, numerical problems on conversion of bearings
	5th	

5th	1st	Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing,
	2nd	Numerical problems on computation of interior & exterior angles from bearings.
	3rd	Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.
	4th	Errors in angle measurement with compass – sources & remedies.
	5th	Principles of traversing – open & closed traverse, Methods of traversing.
6th	1st	Local attraction – causes, detection, errors, corrections,
	2nd	Numerical problems of application of correction due to local attraction
	3rd	Errors in compass surveying – sources & remedies.
	4th	Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table
	5th	Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols
7th	1st	Cadastral Map Preparation Methodology Unique identification number of parcel
	2nd	Positions of existing Control Points and its types Adjacent Boundaries and Features, Topology Creation and verification.
	3rd	Objectives, principles and use of plane table surveying. Instruments & accessories used in plane table surveying
	4th	Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection
	5th	Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying
8th	1st	Purpose and definition of theodolite surveying 6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
	2nd	Concept of transiting –Measurement of horizontal and vertical angles.
	3rd	Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations
	4th	Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method,e

	5th	Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method, e
9th	1st	Plotting the traverse by coordinate method, Checks for open and closed travers
	2nd	Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, ,
	3rd	Numerical problems on omitted measurement of lengths & bearings
	4th	Closing error – adjustment of angular errors, adjustment of bearings, numerical problems
	5th	Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse.
10th	1st	Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse.
	2nd	Definition and Purpose and types of leveling–
	3rd	concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M.
	4th	Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.
	5th	Levelling staff – Temporary adjustments of level, taking reading with level,
11th	1st	concept of bench mark, BS, IS, FS, CP, HI.
	2nd	Field data entry – level Book – height of collimation method and Rise & Fall method, comparison,
	3rd	Numerical problems on reduction of levels applying both methods, Arithmetic checks
	4th	Effects of curvature and refraction, numerical problems on application of correction.
	5th	Reciprocal leveling – principles, methods, numerical problems, precise leveling.
12th	1st	Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.
	2nd	Definitions, concepts and characteristics of contours.
	3rd	Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets.
	4th	of contour maps on civil engineering projects – drawing cross sections from contour maps,
	5th	locating proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour map for simple structure.
13th	1st	Map Interpretation: Interpret Human and Economic Activities (i.e.: Settlement, Communication, Land use etc.),

	2nd	Map Interpretation: Interpret Human and Economic Activities (i.e.: Settlement, Communication, Land use etc.), I
	3rd	Interpret Physical landform (i.e.: Relief, Drainage Pattern etc.), Problem Solving and Decision Making
	4th	Interpret Physical landform (i.e.: Relief, Drainage Pattern etc.), Problem Solving and Decision Making
	5th	Determination of areas, computation of areas from plans.
14th	1st	Determination of areas, computation of areas from plans.
	2nd	2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.
	3rd	2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.
	4th	3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes
	5th	3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes

Discipline-Civil Engineering	Semestar- 4th	Name Of the teaching Faculty: Er.DIPTIRANI MISHRA
Subject-Highway engineering	No. of Days/per week class allotted:5	Semestar From Date : 10/3/2022 To Date: 10/6/2022
		No. Of Weeks:
Week	Class Day	Theory/Practical Topics
1st	1st	Importance of Highway transportation, importance organizations like Indian roads congress
	2nd	Ministry of Surface Transport, Central Road Research Institute, Functions of Indian Roads Congress
	3rd	IRC classification of roads
	4th	IRC classification of roads
	5th	Organisation of state highway department
2nd	1st	Glossary of terms used in geometric and their importance
	2nd	Glossary of terms used in geometric and their importance
	3rd	Right of way, Formation width, Road margin, Road shoulder
	4th	carriage way, side slopes, kerbs, formation leve
	5th	Camber
3rd	1st	Gradient
	2nd	Design and average running speed
	3rd	Stopping Sight Distance
	4th	Stopping Sight Distance
	5th	Problems on Stopping Sight Distance
4th	1st	Overtaking Sight Distance
	2nd	Problems on Overtaking Sight Distance
	3rd	Necessity of curves and Different types of Curves
5th	4th	Horizontal curve, Radius of curve and Degree of Curve
	5th	Vertical Curve
	1st	Problems on curve
	2nd	Superelevation
	3rd	Superelevation
6th	4th	Problems On Super Elevation
	5th	Difference types of road materials in use: soil, aggregates, and binders
	1st	Function of soil as highway Subgrade

	2nd	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
	3rd	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance
	4th	Testing aggregates: Abrasion test, impact test
	5th	Crushing strength test, Water absorption test & Soundness test
7th	1st	Road Pavement: Flexible and rigid pavement, their merits and Demerits
	2nd	Typical cross-sections, functions of various components
	3rd	Flexible pavements: Sub-grade preparation: Setting out alignment of road, setting out bench marks
	4th	Control pegs for embankment and cutting, borrow pits, making profile of embankment, construction of making
	5th	Profile of embankment, construction of embankment, compaction, stabilization embankment, compaction, stabilization, preparation of subgrade,
8th	1st	Methods of checking camber, gradient and alignment as per recommendations of IRC
	2nd	Equipment used for subgrade preparation
	3rd	Necessity of sub base, stabilized sub base, purpose of stabilization
	4th	Mechanical stabilization, Lime stabilization, Cement stabilization, Fly ash stabilization
	5th	Preparation of base course, Brick soling, stone soling and metalling, Water Bound Macadam and wet-mix Macadam
9th	1st	Bituminous constructions: Different types
	2nd	Bituminous constructions: Different types
	3rd	Rigid Pavements: Concept of concrete roads as per IRC specifications
	4th	Introduction: Typical cross-sections showing all details of a typical hill road
	5th	Hill road in cut, partly in cutting and partly in filling
		Breast Walls, Retaining walls, different types of bends
10th	1st	Necessity of road drainage work, cross drainage works
	2nd	Surface and sub-surface drains and storm water drains
	3rd	

	4th	Location, spacing and typical details of side drains, side ditches for surface drainage
	5th	Intercepting drains, pipe drains in hill roads, details of drains in cutting embankment
11th	1st	Typical cross sections of Hill Roads
	2nd	Common types of road failures – their causes and remedies
	3rd	Common types of road failures – their causes and remedies
	4th	Maintenance of bituminous road such as patch work and resurfacing
	5th	Maintenance of concrete roads – filling cracks, repairing joints
12th	1st	Maintenance of concrete roads – filling cracks, repairing joints
	2nd	maintenance of shoulders (berm), maintenance of traffic control devices
	3rd	Basic concept of traffic study
	4th	Basic concept of traffic study
	5th	Basic concept of traffic study
13th	1st	Traffic safety and traffic control signal
	2nd	Traffic safety and traffic control signal
	3rd	Traffic safety and traffic control signal
	4th	Traffic safety and traffic control signal
	5th	Hot mixing plant
14th	1st	Tipper, tractors (wheel and crawler) scraper
	2nd	Bulldozer, dumpers, shovels, graders, roller dragline
	3rd	Asphalt mixer and tar boilers
	4th	Road pavers
	5th	Modern construction equipments for roads.