

IDEAL SCHOOL OF ENGINEERING, RETANG-752054

DISCIPLINE: CIVIL ENGINEERING	SEMESTER: 4TH SEM	NAME OF THE TEACHING FACULTY: ER. ARPITA ROUT & ER. PURAK SUNDARAY
SUBJECT LAND SURVEY- I (Th -3)	No of Days/Per week class allotted: 5 Class P/W(75)	Semester From Date: 15/02/2023 To Date: 23/05/2023 No. Of Weeks: 15
WEEK	CLASS DAY	THEORY
1 st	1 st	INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS: Surveying: Definition, Aims and objectives
	2 nd	Principles of survey-Plane surveying- Geodetic Surveying-
	3 rd	Instrumental surveying, Precision and accuracy of measurements
	4 th	instruments used for measurement of distance, Types of tapes and chains
	5 th	Errors and mistakes in linear measurement – classification, Sources of errors and remedies
2 nd	1 st	Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag
	2 nd	Numerical problem applying corrections
	3 rd	CHAINING AND CHAIN SURVEYING : Equipment and accessories for chaining
	4 th	Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging
	5 th	Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.
3 rd	1 st	Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles.
	2 nd	Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines

	3 rd	Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square
	4 th	Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying
	5 th	ANGULAR MEASUREMENT AND COMPAS SURVEYING : Measurement of angles with chain, tape & compass
4 th	1 st	Compass – Types, features, parts, merits & demerits
	2 nd	Testing & adjustment of compass
	3 rd	Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing
	4 th	Reduced bearing, suitability of application, numerical problems on conversion of bearings
	5 th	Use of compasses – setting in field-centering, leveling, taking readings
5 th	1 st	concepts of Fore bearing, Back Bearing, Numerical problems on computation of interior & exterior angles from bearings.
	2 nd	Effects of earth’s magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination
	3 rd	Errors in angle measurement with compass – sources & remedies
	4 th	Principles of traversing – open & closed traverse, Methods of traversing
	5 th	Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction
6 th	1 st	Errors in compass surveying – sources & remedies. Plotting of traverse – check of closing error in closed & open traverse, Bowditch’s correction, Gales table
	2 nd	MAP READING CADASTRAL MAPS & NOMENCLATURE Study of direction, Scale, Grid Reference
	3 rd	Grid Square Study of Signs and Symbols

	4 th	Cadastral Map Preparation Methodology
	5 th	Unique identification number of parcel
7 th	1 st	Positions of existing Control Points
	2 nd	Positions of existing Control Points and its types
	3 rd	Adjacent Boundaries and Features, Topology Creation and verification
	4 th	PLANE TABLE SURVEYING : Objectives, principles and use of plane table surveying.
	5 th	instruments & accessories used in plane table surveying.
8 th	1 st	Methods of plane table surveying – (1) Radiation, (2) Intersection,
	2 nd	Methods of plane table surveying – (3) Traversing, (4) Resection
	3 rd	Statements of TWO POINT problem
	4 th	THREE POINT PROBLEM
	5 th	Errors in plane table surveying and their corrections, precautions in plane table surveying
9 th	1 st	THEODOLITE SURVEYING AND TRAVERSING: Purpose and definition of theodolite surveying
	2 nd	Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite
	3 rd	concept of vernier, reading a vernier, Temporary adjustment of theodolite
	4 th	Concept of transiting –Measurement of horizontal
	5 th	Concept of transiting –Measurement of vertical angles.
10 th	1 st	Measurement of magnetic bearings, deflection angle, direct angle, setting out angles
	2 nd	prolonging a straight line with theodolite, Errors in Theodolite observations.
	3 rd	Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method,
	4 th	Plotting the traverse by coordinate method, Checks for open and closed traverse.

	5 th	Traverse computation – consecutive coordinates, latitude and departure, Gale’s traverse table, Numerical problems on omitted measurement of lengths & bearings
11 th	1 st	Closing error – adjustment of angular errors, adjustment of bearings,
	2 nd	numerical problems
	3 rd	Balancing of traverse – Bowditch’s method, transit method
	4 th	graphical method, axis method, calculation of area of closed traverse.
	5 th	numerical problems
12 th	1 st	LEVELLING AND CONTOURING Definition and Purpose and types of leveling– concepts of level surface,
	2 nd	Horizontal surface, vertical surface, datum, R. L., B.M
	3 rd	Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis
	4 th	Levelling staff – Temporary adjustments of level
	5 th	taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.
13 th	1 st	Field data entry – level Book – height of collimation method and Rise & Fall method, comparison
	2 nd	Numerical problems on reduction of levels applying both methods, Arithmetic checks
	3 rd	Effects of curvature and refraction, numerical problems on application of correction.
	4 th	Reciprocal leveling – principles, methods, numerical problems, precise leveling.
	5 th	Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels
14 th	1 st	Definitions, concepts and characteristics of contours.
	2 nd	Methods of contouring, plotting contour maps,
	3 rd	Interpretation of contour maps, toposheets.

	4 th	Use of contour maps on civil engineering projects – drawing crosssections from contour maps, locating proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour
	5 th	Map Interpretation: Interpret Human and Economic Activities (i.e.: Settlement, Communication, Land use etc.), Interpret Physical landform (i.e.: Relief, Drainage Pattern etc.), Problem Solving and Decision Making
15 th	1 st	COMPUTATION OF AREA & VOLUME Determination of areas, computation of areas from plans.
	2 nd	Calculation of area by using ordinate rule
	3 rd	Calculation of area by using trapezoidal rule, Simpson's rule
	4 th	Calculation of volumes by prismoidal formula
	5 th	Calculation of volumes trapezoidal formula, Prismoidal corrections, curvature correction for volumes.