ACADEMIC SESSION: SUMMER-2025

Discipline :Civil engg	Semester: 4th	Name of the Teaching Faculty : Subhasmita behera
Subject: Land Survey-I	No. of Days / Week class allotted: 5	Semester Duration: 04/02/2025 to 17/05/2025 No. of Weeks : 15
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
	5th	Sources of errors and remedies.
2nd	1st	Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag
	2nd	numerical problem applying corrections
	3rd	Equipment and accessories for chaining
	4th	Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging.
	5th	Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.
3rd	1st	Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles.
	2nd	Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines.
	3rd	Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square.
	4th	Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying.
	5th	Measurement of angles with chain, tape & compass

4th	1st	Compass – Types, features, parts, merits & demerits
	2nd	Testing & adjustment of compass
	3rd	Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application,
	4th	numerical problems on conversion of bearings
	5th	Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing
5th	1st	Numerical problems on computation of interior & exterior angles from bearings.
	2nd	Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.
	3rd	Errors in angle measurement with compass – sources & remedies.
	4th	Principles of traversing – open & closed traverse, Methods of traversing.
	5th	Local attraction – causes, detection, errors, corrections
6th	1st	Numerical problems of application of correction due to local attraction.
	2nd	Errors in compass surveying – sources & remedies.
	3rd	Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table
	4th	Study of direction, Scale, Grid Reference
	5th	Grid Square Study of Signs and Symbols
7th	1st	Cadastral Map Preparation Methodology
	2nd	Unique identification number of parcel
	3rd	Positions of existing Control Points and its types
	4th	Adjacent Boundaries and Feature
	5th	Topology Creation and verification.
8th	1st	Objectives, principles and use of plane table surveying.
	2nd	Instruments & accessories used in plane table surveying.

	3rd	Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection.
	4th	Statements of TWO POINT and THREE POINT PROBLEM.
	5th	Errors in plane table surveying and their corrections, precautions in plane table surveying.
9th	1st	Purpose and definition of theodolite surveying
	2nd	Transit theodolite- Description of features, component parts
	3rd	Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
	4th	Concept of transiting –Measurement of horizontal and vertical angles.
	5th	Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite
10th	1st	Errors in Theodolite observations.
	2nd	Methods of theodolite traversing with – inclined angle method
	3rd	deflection angle method, bearing method, Plotting the traverse by coordinate method
	4th	Checks for open and closed traverse.
	5th	Numerical problem
11th	1st	Traverse computation – consecutive coordinates
	2nd	latitude and departure
	3rd	Gale's traverse table
	4th	Numerical problems on omitted measurement of lengths & bearings
	5th	Closing error – adjustment of angular errors, .
12th	1st	adjustment of bearings, numerical problems
	2nd	Balancing of traverse – Bowditch's method
	3rd	transit method, graphical method
	4th	axis method, calculation of area of closed traverse
	5th	Numerical problem
13th	1st	Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M.
	2nd	Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.

	3rd	Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.
	4th	Field data entry – level Book – height of collimation method and Rise & Fall method, comparison, Numerical problems on reduction of levels applying both methods, Arithmetic checks.
	5th	Effects of curvature and refraction, numerical problems on application of correction.
14th	1st	Reciprocal leveling – principles, methods, numerical problems, precise leveling.
	2nd	Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.
	3rd	Definitions, concepts and characteristics of contours.
	4th	Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets.
	5th	Use of contour maps on civil engineering projects – drawing cross-sections from contour maps, locating proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour map for simple structure.
15th	1st	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
	2nd	Determination of areas, computation of areas from plans.
	3rd	Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.
	4th	Calculation of volumes by prismoidal formula and trapezoidal formula
	5th	Prismoidal corrections, curvature correction for volumes

Prepared By :

Approved By:

HOD(Civil)