



LESSON PLAN -Land Surveying 1 (Th-03), Batch- 2022-25, Session -2023-24 (SUMMER)

Line: Civil Engineering	Semester: 4th	Name of the Teaching Faculty: Rupeli kumari patro , GF in Civil GP Kandhamal, Phulbani
ct:Land Surveying -1 (Th- 4)	No. of days/ per week class allotted: 5	Semester From Date :16/01/2024 to Date: 26/04/2024 No. of Weeks: 15
Week	Class Day	Theory/ Practical Topics
1ST		INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS:
	1	1.1 Surveying: Definition, Aims and objectives
	2	1.2 Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying
	3	1.3 Precision and accuracy of measurements, instruments used for measurement of distance,
	4	Types of tapes and chains
	5	1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies
2ND	1	1.5 Corrections to measured lengths due to incorrect length, temperature variation
	2	Corrections to measured lengths due to pull, sag, numerical problem applying corrections.
		CHAINING AND CHAIN SURVEYING :
	3	2.1 Equipment and accessories for chaining 2.2 Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging.
	4	2.3 Methods of chaining –Chaining on flat ground, Chaining on sloping ground stepping method, Clinometer- features and use, slope correction.
	5	2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles.
3RD	1	2.5 Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines.
	2	2.7 Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square
	3	2.8 Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying
		ANGULAR MEASUREMENT AND COMPASS SURVEYING :
	4	3.1 Measurement of angles with chain, tape & compass
	5	3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass
4TH	1	3.3 Designation of angles- concept of meridians – Magnetic, True, arbitrary;
	2	Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application, numerical problems on conversion of bearings
	3	3.4 Use of compasses – setting in field-centering, leveling, taking readings,
	4	concepts of Fore bearing, Back Bearing, Numerical problems on computation of interior & exterior angles from bearings.
	5	3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination
5TH	1	3.7 Principles of traversing – open & closed traverse, Methods of traversing.
	2	3.6 Errors in angle measurement with compass – sources & remedies.
	3	3.8 Local attraction – causes, detection, errors, corrections,
	4	Numerical problems of application of correction due to local attraction.
	5	3.9 Errors in compass surveying – sources & remedies.
6TH	1	Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table
		MAP READING CADASTRAL MAPS & NOMENCLATURE:
	2	4.1 Study of direction, Scale, Grid Reference and Grid Square
	3	Study of Signs and Symbols
	4	4.2 Cadastral Map Preparation Methodology
	5	4.3 Unique identification number of parcel
7TH	1	4.4 Positions of existing Control Points and its types
	2	4.5 Adjacent Boundaries and Features,

3	Topology Creation and verification.
PLANE TABLE SURVEYING :	
4	5.1 Objectives, principles and use of plane table surveying
5	5.2 Instruments & accessories used in plane table surveying.
1	5.3 Methods of plane table surveying – (1) Radiation,
2	(2) Intersection, (3) Traversing, (4) Resection
3	5.4 Statements of TWO POINT and THREE POINT PROBLEM
4	Errors in plane table surveying and their corrections, precautions in plane table surveying.
5	precautions in plane table surveying.
THEODOLITE SURVEYING AND TRAVERSING:	
9TH	1 6.1 Purpose and definition of theodolite surveying
	2 6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
	3 6.3 Concept of transiting –Measurement of horizontal and vertical angles
	4 6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite,
10TH	1 Errors in Theodolite observations.
	2 6.5 Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method
	3 Plotting the traverse by coordinate method, Checks for open and closed traverse.
	4 6.6 Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table,
	5 Numerical problems on omitted measurement of lengths & bearings
11TH	1 6.7 Closing error – adjustment of angular errors,
	2 adjustment of bearings, numerical problems
	3 6.8 Balancing of traverse – Bowditch's method
	4 transit method, graphical method,
	5 axis method, calculation of area of closed traverse.
LEVELLING AND CONTOURING	
12TH	1 7.1 Definition and Purpose and types of leveling- concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M
	2 7.2 Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.
	3 7.3 Levelling staff – Temporary adjustments of level, taking reading with level,
	4 concept of bench mark, BS, IS, FS, CP, HI.
	5 7.4 Field data entry – level Book – height of collimation method and Rise & Fall method, comparison,
13TH	1 Numerical problems on reduction of levels applying both methods, Arithmetic checks.
	2 7.5 Effects of curvature and refraction, numerical problems on application of correction.
	3 7.6 Reciprocal leveling – principles, methods, numerical problems, precise leveling.
	4 7.7 Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.
	5 7.8 Definitions, concepts and characteristics of contours
14TH	1 7.9 Methods of contouring, plotting contour maps,
	2 Interpretation of contour maps, toposheets.
	3 7.10 Use of contour maps on civil engineering projects – drawing crosssections from contour maps, locating proposal routes of roads / railway / canal on a contour map
	4 computation of volume of earthwork from contour map for simple structure.
	5 7.11 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
COMPUTATION OF AREA & VOLUME:	
15TH	1 8.1 Determination of areas, computation of areas from plans
	2 8.2 Calculation of area by using ordinate rule,
	3 trapezoidal rule, Simpson's rule.
	4 8.3 Calculation of volumes by prismoidal formula and trapezoidal formula,
	5 Prismoidal corrections, curvature correction for volumes.

Rathin 11/01/2024 *Shiv 11/01/2024*

