



LESSON PLAN: TH.3. LAND SURVEY – I, SESSION -2023-2024 (SUMMER 2023) BATCH-2021-2024(4th Semester)

Discipline: Civil Engineering	Semester: 4th	Name of the Teaching Faculty: Rupeli Kumari Patra (PTGF)
Subject: TH.3- LAND SURVEY – I	No. of days/ per week class allotted: 5	Semester From Date : 14/02/2023 to Date: 21-05-2023 No. of Weeks: 15
Week	Class Day	Theory/ Practical Topics
		1 INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS:
1ST	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, Types of tapes and chains.
	4	1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies.
	5	1.5 Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections.
2ND	1	NUMERICALS
	2	CLASS TEST-1
		2 CHAINING AND CHAIN SURVEYING :
	3	2.1 Equipment and accessories for chaining
	4	2.2 Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging.
	5	2.3 Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.
3RD	1	2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles.
	2	2.5 Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines.
	3	2.7 Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square.
	4	2.8 Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying.
		3 ANGULAR MEASUREMENT AND COMPAS SURVEYING :
	5	3.1 Measurement of angles with chain, tape & compass
4TH	1	3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass
	2	3.3 Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application, numerical problems on conversion of bearings
	3	3.3 Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application, numerical problems on conversion of bearings
	4	3.4 Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing, Numerical problems on computation of interior & exterior angles from bearings.
	5	NUMERICALS
5TH	1	3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.
	2	3.6 Errors in angle measurement with compass – sources & remedies.
	3	3.7 Principles of traversing – open & closed traverse, Methods of traversing
	4	3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction.

	5	3.9 Errors in compass surveying – sources & remedies. Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, correction, Gales table
6TH	1	NUMERICALS
		4 MAP READING CADASTRAL MAPS & NOMENCLATURE:
	2	CLASS TEST -2
	3	4.1 Study of direction, Scale, Grid Reference and Grid Square, 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, Topology Creation and verification
	3	PREVIOUS YESR QUESTION DISCUSSION
		5 PLANE TABLE SURVEYING :
	4	5.1 Objectives, principles and use of plane table surveying.
	5	5.2 Instruments & accessories used in plane table surveying.
8TH	1	5.3 Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection.
	2	NUMERICALS
	3	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.
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	5	NUMERICALS
		6 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	6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
	4	6.3 Concept of transiting –Measurement of horizontal and vertical angles.
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10TH	1	6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.
	2	6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.
	3	6.5 Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method, Plotting the traverse by coordinate method, Checks for open and closed traverse.
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	5	6.6 Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings
11TH	1	6.6 Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings
	2	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems
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	4	6.8 Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse.

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		7 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.
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	4	7.3 Levelling staff – Temporary adjustments of level, taking reading with level, 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, Numerical problems on reduction of levels applying both methods, Arithmetic checks.
13TH	1	7.4 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.
	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, Interpretation of contour maps, toposheets.
	2	7.10 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.
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	4	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
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		8 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, trapezoidal rule, Simpson's rule.
	3	NUMERICALS
	4	8.3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.
	5	NUMERICALS

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