JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA				
Department of Civil Engineering				
4th Sem (2nd Year) Summer 2024				
Course Code:			TH-1	
Course Name:			LAND SURVEY I	
Name Of The Faculty:			Smt. Deepanjali Sethi Smt.Smitarani Patel	
Sl No	**Week No**	**No. Of classes**	**Topics to be covered**	**Remarks**
1	W1	1	INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS: 1.1 Surveying: Definition, Aims and objectives	
2		1	1.2 Principles of survey-Plane surveying- Geodetic Surveying-Instrumental surveying.	
3		1	1.2 Principles of survey-Plane surveying- Geodetic Surveying-Instrumental surveying.	
		1	1.3 Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains	
4		1	1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies	
5		1	1.5 Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections.	
6		1	CHAINING AND CHAIN SURVEYING : 2.1 Equipment and accessories for chaining	

7	W2	1	2.2 Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging.	
		1	2.3 Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer- features and use, slope correction.	
8		1	2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles.	
9	W3	1	2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles.	
		1	2.5 Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines	
10		1	2.7 Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square.	
11		1	2.8 Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying.	
12		1	ANGULAR MEASUREMENT AND COMPAS SURVEYING : 3.1 Measurement of angles with chain, tape & compass	
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14		1	3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass	
15		1	3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass	
	W4	1	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	
16		1	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	
17		1	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.	
18	W5	1	3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination	
19		1	3.6 Errors in angle measurement with compass – sources & remedies.	
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21	W6	1	3.7 Principles of traversing – open & closed traverse, Methods of traversing.	
22		1	3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction.	
23		1	3.9 Errors in compass surveying – sources & remedies. Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table	
		1	MAP READING CADASTRAL MAPS & NOMENCLATURE: 4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols	
24		1	4.2 Cadastral Map Preparation Methodology	
25	W7	1	4.3 Unique identification number of parcel	
26		1	4.4 Positions of existing Control Points and its types	
27		1	4.5 Adjacent Boundaries and Features, Topology Creation and verification.	
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29		1	PLANE TABLE SURVEYING : 5.1 Objectives, principles and use of plane table surveying	
30		1	in plane table surveying.	
31		1	5.3 Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection.	

	W8	1	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.	
32		1	THEODOLITE SURVEYING AND TRAVERSING: 6.1 Purpose and definition of theodolite surveying	
33		1	THEODOLITE SURVEYING AND TRAVERSING: 6.1 Purpose and definition of theodolite surveying	
34		1	6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite	
35		1	6.3 Concept of transiting –Measurement of horizontal and vertical angles.	
	W9	1	6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.	
36		1	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.	
37		1	6.6 Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings	

38		1	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems	
39	W10	1	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems	
		1	6.8 Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse.	
40		1	LEVELLING AND CONTOURING : 7.1 Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M.	
41		1	7.2 Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.	
42		1	7.3 Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.	
43	W11	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.	
		1	7.5 Effects of curvature and refraction, numerical problems on application of correction.	

44		1	7.6 Reciprocal leveling – principles, methods, numerical problems, precise leveling.	
45		1	7.7 Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.	
46		1	7.8 Definitions, concepts and characteristics of contours.	
47		1	7.9 Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets.	
	W12	1	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, computation of volume of earthwork from contour map for simple structure.	
48		1	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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50	W13	1	COMPUTATION OF AREA & VOLUME: 8.1 Determination of areas, computation of areas from plans.	
51		1	8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.	

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52		1	8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.	
53		1	8.3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.	
54	W14	1	8.3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.	
55		1	8.3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.	
		1	REVISION	
56		1	REVISION	
57		1	REVISION	
58		1	PYQ	
59	W15	1	PYQ	
		1	REVISION	
60		1	REVISION	
Total		**75**		

15/01/2024

Signature of Faculty

Smitamani Patil.
(Guest faculty)

15/1/24

Signature of H.O.D

(Amt. 10 from Staff)