

**BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK**  
**DEPARTMENT OF CIVIL ENGINEERING**



**LESSON PLAN**

SUBJECT: LAND SURVEYING – I (TH 3)

FACULTY: PRADIP BEHERA

ACCADEMIC SESSION: 2022-23

SEMESTER: 4<sup>TH</sup> , SEC: B

Sd/-  
H O D (Civil Engg.)

<b>Discipline: Civil Engineering</b>	<b>Semester: 4<sup>th</sup></b>		<b>Name of the teaching faculty: PRADIP BEHERA</b>
<b>Subject: Land Surveying – I</b>	<b>No. of Days/ per week class allotted: 05 period per week. (Tue-1, Wed-1, Thu-2 &amp; Sat-1 period)</b>		<b>Semester From Date: 14-02-2023 To Date: 23-05-2023 No. of weeks: 15 weeks</b>
<b>Week</b>	<b>Class Day</b>	<b>No of period available</b>	<b>Theory Topics</b>
1ST	14/02/2023	1	1 INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS: 1.1 Surveying: Definition, Aims and objectives
	15/02/2023	1	1.2 Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying.
	16/02/2023	2	1.3 Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains.
2ND	21/02/2023	1	1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies.
	22/02/2023	1	1.5 Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections.
	23/02/2023	2	2 CHAINING AND CHAIN SURVEYING : 2.1 Equipment and accessories for chaining
	25/02/2023	1	2.2 Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging
3RD	28/02/2023	1	2.3 Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.

	01/03/2023	1	<b>MONTHLY CLASS TEST 1</b>
	02/03/2023	2	2.3 Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.
	04/03/2023	1	2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles.
4TH	09/03/2023	2	2.5 Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines.
	11/03/2023	1	2.7 Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square.
5TH	14/03/2023	1	2.8 Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying
	15/03/2023	1	3 ANGULAR MEASUREMENT AND COMPAS SURVEYING : 3.1 Measurement of angles with chain, tape & compass
	16/03/2023	2	3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass
	18/03/2023	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.
6TH	21/03/2023	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
	22/03/2023	1	3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.
	23/03/2023	2	3.6 Errors in angle measurement with compass – sources & remedies.

			3.7 Principles of traversing – open & closed traverse, Methods of traversing
	25/03/2023	1	3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction.
7TH	28/03/2023	1	4 MAP READING CADASTRAL MAPS & NOMENCLATURE: 4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols
	29/03/2023	1	4.2 Cadastral Map Preparation Methodology 4.3 Unique identification number of parcel
8TH	04/04/2023	1	4.4 Positions of existing Control Points and its types 4.5 Adjacent Boundaries and Features, Topology Creation and verification
	05/04/2023	1	5 PLANE TABLE SURVEYING: 5.1 Objectives, principles and use of plane table surveying.
	06/04/2023	2	5.2 Instruments & accessories used in plane table surveying.
	08/04/2023	1	5.3 Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection.
9TH	11/04/2023	1	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.
	12/04/2023	1	6 THEODOLITE SURVEYING AND TRAVERSING: 6.1 Purpose and definition of theodolite surveying
	13/04/2023	2	<b>MONTHLY CLASS TEST 2</b>
	15/04/2023	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

10TH	18/04/2023	1	6.3 Concept of transiting –Measurement of horizontal and vertical angles. 6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.
	19/04/2023	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.
	20/04/2023	2	6.6 Traverse computation – consecutive coordinates, latitude and departure
	22/04/2023	1	Gale’s traverse table, Numerical problems on omitted measurement of lengths & bearings
11TH	25/04/2023	1	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems.
	26/04/2023	1	6.8 Balancing of traverse – Bowditch’s method, transit method, graphical method, axis method,
	27/04/2023	2	calculation of area of closed traverse
	29/04/2023	1	7 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.
12TH	02/05/2023	1	7.2 Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.
	03/05/2023	1	7.3 Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.
	04/05/2023	2	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.
	06/05/2023	1	7.5 Effects of curvature and refraction, numerical problems on application of correction.
13TH	09/05/2023	1	7.6 Reciprocal leveling – principles, methods, numerical problems, precise leveling.
	10/05/2023	1	7.7 Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.
	11/05/2023	2	7.8 Definitions, concepts and characteristics of contours. 7.9 Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets
	13/05/2023	1	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.
14TH	16/05/2023	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
	17/05/2023	1	8 COMPUTATIONS OF AREA & VOLUME: 8.1 Determination of areas, computation of areas from plans.
	18/05/2023	2	8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.
	20/05/2023	1	8.3 Calculation of volumes by prismoidal formula and trapezoidal formula. Prismoidal corrections, curvature correction for volumes
15TH	23/05/2023	1	REVISIONS