

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF CIVIL ENGINEERING



LESSON PLAN

SUBJECT: LAND SURVEYING – I (TH 3)

FACULTY: Ms. Malbika Patra

ACCADEMIC SESSION: 2023-24

SEMESTER: 4TH

SEC: C

Sd/-
HOD (Civil Engineering.)

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Discipline: Civil Engineering	Semester: 4th (C)		Name of the teaching faculty: Ms. Malbika Patra
Subject: Land Surveying – I	No. of Days/ per week class allotted: 05 periods per week. (Mon-1, Tue-1, wed-1, Thu-1, Fri-1, period)		Semester From Date: 16-01-2024 To Date: 26-04-2024 No. of weeks: 15 weeks
Week	Class Day	No of period available	Theory Topics
1 st	16/01/2024	1	1 INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS: 1.1 Surveying: Definition, Aims and objectives
	17/01/2024	1	1.2 Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying.
	18/01/2024	1	1.3 Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains.
	19/01/2024	1	1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies.
2 nd	22/01/2024	1	1.5 Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections.
	24/01/2024	1	2 CHAINING AND CHAIN SURVEYING: 2.1 Equipment and accessories for chaining
	25/01/2024	1	2.2 Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging.
3 rd	29/01/2024	1	2.3 Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.
	30/01/2024	1	2.3 Clinometer-features and use, slope correction.

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	31/01/2024	1	2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles – Numerical problems on chaining across obstacles.
	01/02/2024	1	2.5 Purpose of chain surveying, Its Principles, concept of field book.
	02/02/2024	1	2.6 Selection of survey stations, base line, tie lines, Check lines.
4th	05/02/2024	1	2.7 Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square.
	06/02/2024	1	2.8 Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying
	07/02/2024	1	3 ANGULAR MEASUREMENT AND COMPAS SURVEYING: 3.1 Measurement of angles with chain, tape & compass
	08/02/2024	1	3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass.
	09/02/2024	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.
5th	12/02/2024	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.
	13/02/2024	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
	15/02/2024	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
	16/02/2024	1	3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.

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6th	19/02/2024	1	Monthly class test 1
	20/02/2024	1	3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.
	21/02/2024	1	3.6 Errors in angle measurement with compass – sources & remedies.
	22/02/2024	1	3.7 Principles of traversing – open & closed traverse, Methods of traversing.
	23/02/2024	1	3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction.
7th	26/02/2024	1	4 MAP READING CADASTRAL MAPS & NOMENCLATURE: 4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols
	27/02/2024	1	4.2 Cadastral Map Preparation Methodology
	28/02/2024	1	4.3 Unique identification number of parcel
	29/02/2024	1	4.4 Positions of existing Control Points and its types
	01/03/2024	1	4.5 Adjacent Boundaries and Features, Topology Creation and verification
8th	04/03/2024	1	5 PLANE TABLE SURVEYING: 5.1 Objectives, principles and use of plane table surveying. 5.2 Instruments & accessories used in plane table surveying.
	06/03/2024	1	5.3 Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection.
	07/03/2024	1	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.
9th	11/03/2024	1	6 THEODOLITE SURVEYING AND TRAVERSING: 6.1 Purpose and definition of theodolite surveying 6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a

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			theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
	12/03/2024	1	6.3 Concept of transiting –Measurement of horizontal and vertical angles.
	13/03/2024	1	6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.
	14/03/2024	1	6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.
	15/03/2024	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.
10th	18/03/2024	1	6.6 Traverse computation – consecutive coordinates, latitude and departure Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings
	19/03/2024	1	Monthly class test 2
	20/03/2024	1	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problem.
	21/03/2024	1	6.8 Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse
	22/03/2024	1	6.8 Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse
11th	27/03/2024	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.
	28/03/2024	1	7.2 Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.
12th	02/04/2024	1	Internal Assesment
	03/04/2024	1	Internal Assesment

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	04/04/2024	1	7.3 Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI. 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.
	05/04/2024	1	7.5 Effects of curvature and refraction, numerical problems on application of correction.
13th	08/04/2024	1	7.6 Reciprocal leveling – principles, methods, numerical problems, precise leveling. 7.7 Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.
	09/04/2024	1	7.8 Definitions, concepts and characteristics of contours.
	10/04/2024	1	7.9 Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets
	12/04/2024	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	15/04/2024	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
	16/04/2024	1	8 COMPUTATIONS OF AREA & VOLUME: 8.1 Determination of areas, computation of areas from plans.
	18/04/2024	1	8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.
	19/04/2024	1	8.3 Calculation of volumes by primordial formula and trapezoidal formula, Primordial corrections, curvature correction for volumes
15th	22/04/2024	1	Revisions and Previous year question answer discussions.
	23/04/2024	1	Revisions and Previous year question answer discussions.

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	24/04/2024	1	Revisions and Previous year question answer discussions.
	25/04/2024	1	Revisions and Previous year question answer discussions.
	26/04/2024	1	Revisions and Previous year question answer discussions.