BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK

DEPARTMENT OF CIVIL ENGINEERING

LESSON PLAN

SUBJECT: LAND SURVEYING – I (TH 3)

FACULTY: SRI ADITYA RANJAN PATRA

ACCADEMIC SESSION: 2022-23

SEMESTER: 4TH

SEC: A

Sd/-

HOD (Civil Engineering.)

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Discipline: Civil Engineering	**Semester: 4th (A)**		**Name of the teaching faculty: Sri Aditya Ranjan Patra**
Subject: Land Surveying – I	**No. of Days/ per week class allotted: 05 periods per week. (Tue-2, Thu-1, Fri-1, Sat-1 period)**		**Semester From Date: 14-02-2023** **To Date: 23-05-2023** **No. of weeks: 15 weeks**
Week	**Class Day**	**No of period available**	**Theory Topics**
1st	14/02/2023	2	1 INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS: 1.1 Surveying: Definition, Aims and objectives
	16/02/2023	1	1.2 Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying.
	17/02/2023	1	1.3 Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains.
2nd	21/02/2023	2	1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies.
	23/02/2023	1	1.5 Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections.
	24/02/2023	1	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	2	2.3 Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.
	02/03/2023	1	2.3 Clinometer-features and use, slope correction.

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	03/03/2023	1	2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles – Numerical problems on chaining across obstacles.
	04/03/2023	1	2.5 Purpose of chain surveying, Its Principles, concept of field book. 2.6 Selection of survey stations, base line, tie lines, Check lines.
4th	09/03/2023	1	2.7 Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square.
	10/03/2023	1	2.8 Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying
	11/03/2023	1	Monthly class test -1
5th	14/03/2023	2	3 ANGULAR MEASUREMENT AND COMPAS SURVEYING: 3.1 Measurement of angles with chain, tape & compass
	16/03/2023	1	3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass.
	17/03/2023	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.
	18/03/2023	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
6th	21/03/2023	2	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	1	3.6 Errors in angle measurement with compass – sources & remedies. 3.7 Principles of traversing – open & closed traverse, Methods of traversing.
	24/03/2023	1	3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction.

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	25/03/2023	1	4 MAP READING CADASTRAL MAPS & NOMENCLATURE: 4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols
7th	28/03/2023	2	4.2 Cadastral Map Preparation Methodology 4.3 Unique identification number of parcel
	31/03/2023	1	4.4 Positions of existing Control Points and its types 4.5 Adjacent Boundaries and Features, Topology Creation and verification
8th	04/04/2023	2	5 PLANE TABLE SURVEYING: 5.1 Objectives, principles and use of plane table surveying. 5.2 Instruments & accessories used in plane table surveying.
	06/04/2023	1	5.3 Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection.
	08/04/2023	1	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.
9th	11/04/2023	2	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 theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
	13/04/2023	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.
	15/04/2023	1	Monthly class test-2
10th	18/04/2023	2	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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	20/04/2023	1	6.6 Traverse computation – consecutive coordinates, latitude and departure Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings
	21/04/2023	1	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problem.
	22/04/2023	1	6.8 Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse
11th	25/04/2023	2	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.
	27/04/2023	1	7.2 Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.
	28/04/2023	1	Internal Assessment
	29/04/2023	1	Internal Assessment
12th	02/05/2023	2	7.3 Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.
	04/05/2023	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.
	06/05/2023	1	7.5 Effects of curvature and refraction, numerical problems on application of correction.
13th	09/05/2023	2	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.
	11/05/2023	1	7.8 Definitions, concepts and characteristics of contours. 7.9 Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets

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	12/05/2023	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.
	13/05/2023	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
14th	16/05/2023	2	8 COMPUTATIONS OF AREA & VOLUME: 8.1 Determination of areas, computation of areas from plans.
	18/05/2023	1	8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule. 8.3 Calculation of volumes by primordial formula and trapezoidal formula, Primordial corrections, curvature correction for volumes
	20/05/2023	1	Monthly class test-3
15th	23/05/2023	2	Revisions and Previous year question answer discussions.