Lesson Plan: Session 2022 - 23 (Summer)

(5 periods per week, total 75 periods in SEM)

DISCIPLINE: Civil Engineering	SEMESTER:4th Semester	NAME OF THE TEACHING FACULTY: P Sankar Rao PTGF (Civil Engg.)
SUBJECT:Land Survey-1	NO. OF DAYS/PER WEEK CLASSES ALLOTTED:5	SEMESTER FROMDATE: 14.02.2023 TO DATE: _____ NO. OF WEEKS:15

Week	Class Day	Topics
1st		**1. INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS**
	1ST	1.1 Surveying: Definition, Aims and objectives
	2ND	1.2 Principles of survey-Plane surveying- Geodetic Surveying-Instrumental surveying.
	3RD	1.3 Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains.
	4TH	1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies.
	5th	1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies.
2nd	1st	1.5 Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections.
	2nd	1.5 Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections.
		2. CHAINING AND CHAIN SURVEYING
	3rd	2.1 Equipment and accessories for chaining
	4th	2.2 Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging
	5th	2.3 Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.
3rd	1st	2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles.
	2nd	2.5 Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines.

P. Sankar Rao
08.02.2023

Principal
Govt. Polytechnic
Malkangiri. (Odisha)

	3rd	2.7 Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square
	4th	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	
	5th	3.1 Measurement of angles with chain, tape & compass
4th	1st	3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass
	2nd	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
	3rd	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.
	4th	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.
	5th	3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.
5th	1st	3.6 Errors in angle measurement with compass – sources & remedies.
	2nd	3.7 Principles of traversing – open & closed traverse, Methods of traversing.
	3rd	3.7 Principles of traversing – open & closed traverse, Methods of traversing.

P. Sankar Rao
08.02.2023

	4th	3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction.
	5th	3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction.
6th	1st	3.9 Errors in compass surveying – sources & remedies. Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table
	4. MAP READING CADASTRAL MAPS & NOMENCLATURE	
	2nd	4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols
	3rd	4.2 Cadastral Map Preparation Methodology
	4th	4.2 Cadastral Map Preparation Methodology
	5th	4.3 Unique identification number of parcel
7th	1st	4.4 Positions of existing Control Points and its types
	2nd	4.5 Adjacent Boundaries and Features, Topology Creation and verification
	3rd	4.5 Adjacent Boundaries and Features, Topology Creation and verification
	5. PLANE TABLE SURVEYING	
	4th	5.1 Objectives, principles and use of plane table surveying.
	5th	5.2 Instruments & accessories used in plane table surveying
8th	1st	5.3 Methods of plane table surveying – (1) Radiation
	2nd	5.3 Methods of plane table surveying –(2) Intersection, (3) Traversing
	3rd	5.3 Methods of plane table surveying –(4) Resection.
	4th	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.

P. Sankar Rao
08.02.2023

	5th	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.
	6. THEODOLITE SURVEYING AND TRAVERSING	
9th	1st	6.1 Purpose and definition of theodolite surveying
	2nd	6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
	3rd	6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
	4th	6.3 Concept of transiting –Measurement of horizontal and vertical angles.
	5th	6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.
10th	1st	6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.
	2nd	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.
	3rd	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.
	4th	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.
	5th	6.6 Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings
11th	1st	6.6 Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted

P. Sankar Rao
08.02.2023

		measurement of lengths & bearings
	2nd	6.6 Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings
	3rd	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems
	4th	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems
	5th	6.8 Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse.
	7. LEVELLING AND CONTOURING	
12th	1st	7.1 Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M.
	2nd	7.1 Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M.
	3rd	7.2 Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.
	4th	7.2 Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.
	5th	7.3 Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.
13th	1st	7.3 Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.
	2nd	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.
	3rd	7.5 Effects of curvature and refraction, numerical problems on application of correction.
	4th	7.5 Effects of curvature and refraction, numerical problems on application of correction.

8/2/23

P. Sankar Rao
08.02.2023

	5th	7.6 Reciprocal leveling – principles, methods, numerical problems, precise leveling.
14th	1st	7.7 Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.
	2nd	7.8 Definitions, concepts and characteristics of contours
	3rd	7.9 Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets.
	4th	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.
	5th	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
	8. COMPUTATION OF AREA & VOLUME	
15th	1st	8.1 Determination of areas, computation of areas from plans.
	2nd	8.1 Determination of areas, computation of areas from plans.
	3rd	8.2 Calculation of area by using ordinate rule
	4th	8.2 Calculation of area by using ordinatetrapezoidal rule
	5th	8.2 Calculation of area by using Simpson's rule.

P. Sankar Rao
08.02.2023

8/2/23