

Discipline: <b>CIVIL</b>	Semester: <b>4<sup>TH</sup></b>	Name of the Teaching Faculty: <b>AMARPREET SAHU</b>
Subject: LAND SURVEY – 1	No. of Days/per week class allotted: 05	Semester From Date: 14-02-2023 To Date: 23-05-2023 No. of weeks: 15
<b>Week</b>	<b>Class Day</b>	<b>Theory Topics</b>
1 <sup>st</sup>	01	INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS
	02	Surveying: Definition, Aims and objectives
	03	Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying
	04	Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains
	05	Errors and mistakes in linear measurement – classification, Sources of errors and remedies
2 <sup>nd</sup>	01	Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag
	02	numerical problem applying corrections
	03	CHAINING AND CHAIN SURVEYING: Equipment and accessories for chaining
	04	Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging
	05	Methods of chaining – Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction
3 <sup>rd</sup>	01	Setting perpendicular with chain & tape, Chaining across different types of obstacles – Numerical problems on chaining across obstacles
	02	Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines
	03	Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square
	04	Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying
	05	ANGULAR MEASUREMENT AND COMPAS SURVEYING: Measurement of angles with chain, tape & compass
4 <sup>th</sup>	01	Compass – Types, features, parts, merits & demerits, testing & adjustment of compass
	02	Designation of angles- concept of meridians – Magnetic, True, arbitrary
	03	Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application, numerical problems on conversion of bearings
	04	Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing
	05	Numerical problems on computation of interior & exterior angles from bearings
5 <sup>th</sup>	01	Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination

	02	Errors in angle measurement with compass – sources & remedies
	03	Principles of traversing – open & closed traverse, Methods of traversing
	04	Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction
	05	Errors in compass surveying – sources & remedies
6 <sup>th</sup>	01	Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table
	02	MAP READING CADASTRAL MAPS & NOMENCLATURE: Study of direction, Scale, Grid Reference and Grid Square
	03	Study of Signs and Symbols
	04	Cadastral Map Preparation Methodology
	05	Unique identification number of parcel
7 <sup>th</sup>	01	Positions of existing Control Points and its types
	02	Adjacent Boundaries and Features
	03	Topology Creation and verification
	04	PLANE TABLE SURVEYING: Objectives, principles and use of plane table surveying
	05	Instruments & accessories used in plane table surveying
8 <sup>th</sup>	01	Methods of plane table surveying – (1) Radiation, (2) Intersection
	02	Methods of plane table surveying – (3) Traversing, (4) Resection
	03	Statements of TWO POINT
	04	THREE POINT PROBLEM
	05	Errors in plane table surveying and their corrections, precautions in plane table surveying
9 <sup>th</sup>	01	THEODOLITE SURVEYING AND TRAVERSING: Purpose and definition of theodolite surveying
	02	Transit theodolite- Description of features, component parts
	03	Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
	04	Concept of transiting –Measurement of horizontal
	05	Concept of transiting –vertical angles
10 <sup>th</sup>	01	Measurement of magnetic bearings, deflection angle, direct angle, setting out angles
	02	prolonging a straight line with theodolite, Errors in Theodolite observations
	03	Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method
	04	Plotting the traverse by coordinate method, Checks for open and closed traverse
	05	Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table
11 <sup>th</sup>	01	Numerical problems on omitted measurement of lengths & bearings
	02	Closing error – adjustment of angular errors
	03	adjustment of bearings, numerical problems
	04	Balancing of traverse – Bowditch's method, transit method, graphical method

	05	axis method, calculation of area of closed traverse
12 <sup>th</sup>	01	LEVELLING AND CONTOURING: Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M.
	02	Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis
	03	Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI
	04	Field data entry – level Book – height of collimation method and Rise & Fall method, comparison
	05	Numerical problems on reduction of levels applying both methods, Arithmetic checks
13 <sup>th</sup>	01	Effects of curvature and refraction
	02	numerical problems on application of correction
	03	Reciprocal leveling – principles, methods
	04	numerical problems, precise leveling
	05	Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels
14 <sup>th</sup>	01	Definitions, concepts and characteristics of contours
	02	Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets
	03	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
	04	Map Interpretation: Interpret Human and Economic Activities (i.e.: Settlement, Communication, Land use etc.), Interpret Physical landform (i.e.: Relief, Drainage Pattern etc.)
	05	Problem Solving and Decision Making
15 <sup>th</sup>	01	COMPUTATION OF AREA & VOLUME: Determination of areas, computation of areas from plans
	02	Calculation of area by using ordinate rule
	03	trapezoidal rule
	04	Simpson’s rule
	05	Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes