

PROGRAMME : CIVIL ENGINEERING COURSE NAME : LAND SURVEY-1 COURSE CODE :TH-3 SEMESTER :4th PERIODS/WEEK: 5 TOTAL PERIODS: 75	NAME OF THE FACULTY: DURLAVI SWAIN SESSION : 2022-2023 DATE : 13-02-2023 to 23-05-2023
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WEEK	CLASS	TOPICS
1	1	Surveying: Definition, Aims and objectives
	2	Principle of surveying-plane surveying, geodetic surveying, instrumental surveying
	3	Precision and accuracy of measurements, instruments used for measurement of distance
	4	Types of tapes and chains
	5	Errors and mistakes in linear measurement – classification, Sources of errors and remedies.
2	1	Corrections to measured lengths due to-incorrect length
	2	Temperaturevariation, pull, sag
	3	Numerical problem applying corrections
	4	Numerical, numerical problem applying corrections
	5	Numerical problem applying corrections
3	1	Equipment and accessories for chaining
	2	Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging.
	3	Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometers-features and use, slope correction.
	4	Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles.
	5	Purpose of chain surveying, Its Principles, concept of field book.
4	1	Selection of survey stations, base line, tie lines, Check lines
	2	Offsets – Necessity, Perpendicular and Oblique offsets, Instruments forsetting offset.
	3	Cross Staff, Optical Square
	4	Errors in chain surveying – compensating and accumulative errors causes & remedies
	5	Precautions to be taken during chain surveying
5	1	Measurement of angles with chain, tape & compass
	2	Compass – Types, features, parts, merits & demerits, testing & adjustmentof compass
	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
	4	Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing, Numerical problems on computationof interior & exterior angles from bearings
	5	Effects of earth’s magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination

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

	5	Balancing of traverse – Bowditch’s method, transit method, graphical method, axis method, calculation of area of closed traverse
12	1	Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M.
	2	Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis
	3	Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.
	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
	5	Effects of curvature and refraction, numerical problems on application of correction
13	1	Reciprocal leveling – principles, methods, numerical problems, precise leveling
	2	Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.
	3	Definitions, concepts and characteristics of contours
	4	Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets
	5	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.
14	1	Map Interpretation: Interpret Human and Economic Activities (i.e.: Settlement, Communication, Land use etc.)
	2	Interpret Physical landform (i.e.:Relief, Drainage Pattern etc.), Problem Solving and Decision Making
	3	Determination of areas, computation of areas from plans.
	4	Calculation of area by using ordinate rule
	5	Calculation of area by using Trapezoidal rule
15	1	Calculation of area by using Simpson’s rule
	2	Calculation of volumes by prismoidal formula
	3	Calculation of volumes by trapezoidal formula, Prismoidal corrections, curvature correction for volumes
	4	Rivision class
	5	Rivision class

