DISCIPLINE-CIVIL ENGG.	SEMESTER-4TH		NAME OF THE TEACHING FACULTY-PRIYABRATA TRIPATHY	
SUBJECT-SURVEYING-I	NO. OF DAYS PER WEEK CLASS ALLOTTED-03/05		SEMESTER FROM DATE-10/03/22　　　TO DATE-10/06/22 NO. OF WEEKS-16	
WEEK	CLASS DAY		THEORY TOPICS	
1ST	1ST		**INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS:** 1.1 Surveying: Definition, Aims and objectives 1.2 Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying.	
2ND	1st		1.3 Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains.	
	2nd		1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies.	
	3rd		1.5 Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections.	
3RD	1st		**CHAINING AND CHAIN SURVEYING :** 2.1 Equipment and accessories for chaining 2.2 Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging.	
	2nd		2.3 Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.	
	3rd		2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles.	
4TH	1st		2.5 Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines.	
	2nd		2.7 Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square.	
	3rd		2.8 Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying.	
5TH	1st		**ANGULAR MEASUREMENT AND COMPAS SURVEYING :** 3.1 Measurement of angles with chain, tape & compass 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.
6TH	1st		3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.
	2nd		3.6 Errors in angle measurement with compass – sources & remedies. 3.7 Principles of traversing – open & closed traverse, Methods of traversing.
	3rd		3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction.
7TH	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
	2nd		**MAP READING CADASTRAL MAPS & NOMENCLATURE:** 4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols
	3rd		4.2 Cadastral Map Preparation Methodology 4.3 Unique identification number of parcel
8TH	1st		4.4 Positions of existing Control Points and its types
	2nd		4.5 Adjacent Boundaries and Features, Topology Creation and verification.
	3rd		**PLANE TABLE SURVEYING :** 5.1 Objectives, principles and use of plane table surveying. 5.2 Instruments & accessories used in plane table surveying.
9TH	1st		5.3 Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection.
	2nd		5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.
	3rd		**THEODOLITE SURVEYING AND TRAVERSING:** 6.1 Purpose and definition of theodolite surveying 6.2 Transit theodolite- Description of features,
10TH	1st		component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
	2nd		6.3 Concept of transiting –Measurement of horizontal and vertical angles.
	3rd		6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations
11TH	1st		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.
	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 6.8 Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse.
12TH	1st		**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.
	2nd		7.2 Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis. 7.3 Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.
	3rd		7.5 Effects of curvature and refraction, numerical problems on application of correction. 7.6 Reciprocal leveling – principles, methods, numerical problems, precise leveling.
13TH	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. 7.9 Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets.
	3rd		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	1st		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
	2nd		**COMPUTATION OF AREA & VOLUME:** 8.1 Determination of areas, computation of areas from plans.
	3rd		8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.
15TH	1ST		8.3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.

1