LESSON PLAN-4th SEMESTER(2021)				
Subject- Land surveying -I				
Branch- Civil Engg				
Name of the Faculty- Subhadra Mahanta				
MONTH	MODULE/UNIT	COURSE TO BE COVERED	CLASSES REQUIRED	REMARKS (IF ANY)
	Unit-1	INTRODUCTION TO SURVEYING, LINEAR MEASUREMENT	07	
	1.1	Surveying: Definition, Aimsand objectives	1	
	1.2	Principles of survey-Planesurveying- Geodetic Surveying- Instrumental surveying.	1	
	1.3	Precision and accuracy of measurements, instrumentsused for measurement of distance, Types of tapes and chains.	1	
	1.4	Errors and mistakes in linearmeasurement – classification, Sources of errors and remedies.	2	
	1.5	Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applyingcorrections.	2	
	Unit-2	CHAINING AND CHAINSURVEYING :	07	
	2.1	Equipment and accessoriesfor chaining	1	
	2.2	Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging.	1	
	2.3	Methods of chaining – Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.	1	
	2.4	Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining acrossobstacles.	1	
	2.5	Purpose of chain surveying,Its Principles, concept of field book.	1	
		Selection of survey stations,base line, tie lines, Check lines.		
	2.7	Offsets – Necessity, Perpendicular and Obliqueoffsets, Instruments for setting offset – Cross Staff,Optical Square.	1	
	2.8	Errors in chain surveying – compensating and accumulativeerrors causes & remedies, Precautions to be taken during chain surveying.	1	
	Unit-3	ANGULAR MEASUREMENT AND COMPAS SURVEYING :	12	
	3.1	Measurement of angles with chain,tape & compass	1	

	3.2	Compass – Types, features, parts,merits & demerits, testing & adjustment of compass	1	
	3.3	Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing, Reducedbearing, suitability of application, numerical problems on conversion of bearings	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 frombearings.	1	
	3.5	Effects of earth's magnetism – dip of needle, magnetic declination, variationin declination, numerical problems on application of correction for declination.	2	
	3.6	Errors in angle measurement withcompass – sources & remedies. .	1	
	3.7	Principles of traversing – open &closed traverse, Methods of traversing.	1	
	3.8	Local attraction – causes, detection,errors, corrections, Numerical problems of application of correction due tolocal attraction.	2	
	3.9	Errors in compass surveying –sources & remedies. Plotting of traverse – check of closingerror in closed & open traverse, Bowditch's correction, Gales table	2	
Unit-4		**MAP READING CADASTRAL MAPS**	**07**	
	3.8	Local attraction – causes, detection,errors, corrections, Numerical problems of application of correction due tolocal attraction.	2	
		& NOMENCLATURE:		
	4.1	Study of direction, Scale, GridReference and Grid Square Study of Signs and Symbols	2	
	4.2	Cadastral Map Preparation Methodology	1	
	4.3	Unique identification number of parcel	1	
	4.4	Positions of existing Control Pointsand its types	1	
	4.5	Adjacent Boundaries and Features,Topology Creation and verification.	2	
Unit-5		**PLANE TABLE SURVEYING**	**07**	
	5.1	Objectives, principles and use ofplane table surveying.	1	
	5.2	Instruments & accessories used inplane table surveying.	1	
	5.3	Methods of plane table surveying – (1)Radiation, (2) Intersection, (3) Traversing, (4) Resection.	2	

	5.4	Statements of two point and threepoint problem Errors in plane table surveying and their corrections, precautions in planetable surveying	3	
	Unit-6	**THEODOLITE SURVEYING AND TRAVERSING**:	**15**	
	6.1	Purpose and definition of theodolitesurveying	1	
	6.2	Transit theodolite- Description offeatures, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporaryadjustment of theodolite	2	
	6.3	Concept of transiting –Measurementof horizontal and vertical angles.	2	
		Functions of Personnel Management		
	6.4	Measurement of magnetic bearings, deflection angle, direct angle, settingout angles, prolonging a straight line withtheodolite, Errors in Theodolite observations.	2	
	6.5	Methods of theodolite traversing with – inclined angle method, deflectionangle method, bearing method, Plotting the traverse by coordinatemethod, Checks for open and closed traverse.	3	
	6.6	Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurement oflengths & bearings	2	
	6.7	Closing error – adjustment of angularerrors, adjustment of bearings, numerical problems .	1	
	6.8	Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation ofarea of closed traverse.	2	
	Unit-7	**LEVELLING AND CONTOURING** :	**15**	
	7.1	Definition and Purpose and typesof leveling–concepts of level surface, Horizontal surface, verticalsurface, datum, R. L., B.M.	1	
	7.2	Instruments used for leveling, concepts of line of collimation,axis of bubble tube, axis of telescope, Verticalaxis.	1	
	7.3	Levelling staff – Temporary adjustments of level, takingreading with level, concept of bench mark, BS, IS,FS, CP, HI.	2	
	7.4	Field data entry – level Book – height of collimation method andRise & Fall method, comparison, Numericalproblems on reduction of levels applying both methods, Arithmetic checks.	2	
	7.5	Effects of curvature and refraction, numerical problems onapplication of correction.	1	
	7.6	Reciprocal leveling – principles,methods, numerical problems, precise leveling.	1	

	7.7	Errors in leveling and precautions, Permanent andtemporary adjustments of different types of levels.	1	
	7.8	Definitions, concepts and characteristics of contours.	1	
	7.9	Methods of contouring, plotting contour maps, Interpretation ofcontour maps, toposheets.	1	
	7.10	Use of contour maps on civil engineering projects – drawing crosssections from contour maps, locating proposal routes ofroads / railway / canal on a contour map, computation of volume ofearthwork from contour map for simple structure.	2	
	7.11	Map Interpretation: Interpret Human and Economic Activities(i.e.: Settlement, Communication, Land use etc.), Interpret Physicallandform (i.e.: Relief, Drainage Pattern etc.),Problem Solving and DecisionMaking	2	
	7.6	Reciprocal leveling – principles,methods, numerical problems, precise leveling.	1	
	7.7	Errors in leveling and precautions, Permanent andtemporary adjustments of different types of levels.	1	
	7.8	Definitions, concepts and characteristics of contours.	1	
	7.9	Methods of contouring, plotting contour maps, Interpretation ofcontour maps, toposheets.	1	
	7.10	Use of contour maps on civil engineering projects – drawing crosssections from contour maps, locating proposal routes ofroads / railway / canal on a contour map, computation of volume ofearthwork from contour map for simple structure.	2	
	Unit-8	**COMPUTATION OF AREA &VOLUME**:	5	
	8.1	Determination of areas, computation of areas fromplans.	1	
	8.2	Calculation of area by using ordinate rule, trapezoidal rule,Simpson's rule.	2	
	8.3	Calculation of volumes byprismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes	2	