GOVT. POLYTECHNIC MAYURBHANJ
LESSON PLAN- 2021/22 (SUMMER)

Discipline : CIVIL ENGG.	Semester: 4th	Name of the Teaching Faculty : SUBHADRA MOHANTA	
Subject : LAND SURVEY-I (TH.3)	No. of Days / per week class allotted : 05	Semester From date : 10.03.2022	To Date : 10.06.2022

MONTH	Week	Day	Unit	Topics
MARCH	2ND	4TH		INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS: Surveying: Definition, Aims and objectives
		5TH	UNIT-I	Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying.
	3RD	1ST		Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains,Errors and mistakes in linear measurement – classification
		2ND		Sources of errors and remedies. Corrections to measured lengths due to-incorrect length,
		3RD		Corrections to measured lengths due to- temperature variation, pull, sag
		4TH		numerical problem applying corrections
	4TH	1ST		CHAINING AND CHAIN SURVEYING : Equipment and accessories for chaining, Ranging – Purpose, signalling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging
		2ND		Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction
		3RD		Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles
		4TH	UNIT-II	Purpose of chain surveying; Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines
		5TH		Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square.
	5TH	1ST		Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying.
		2ND		ANGULAR MEASUREMENT AND COMPAS SURVEYING : Measurement of angles with chain, tape & compass
		3RD		Compass – Types, features, parts, merits & demerits, testing & adjustment ofcompass
		4TH		Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application

Month	Week	Period	Unit	Topic
APRIL		1ST		numerical problems on conversion of bearings
	2ND	2ND	UNIT-III	Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing
		3RD		Numerical problems on computation of interior & exterior angles from bearings.
		4TH		Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination
		5TH		Numerical problems on application of correction for declination., Errors in angle measurement with compass – sources & remedies
	3RD	1ST		Principles of traversing – open & closed traverse, Methods of traversing.
		2ND		Local attraction – causes, detection, errors, corrections,Numerical problems of application of correction due to local attraction.
		3RD		Errors in compass surveying – sources & remedies,Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table
	4TH	1ST	UNIT-IV	MAP READING CADASTRAL MAPS & NOMENCLATURE: Study of direction, Scale, Grid Reference,Grid Square Study of Signs and Symbols,Cadastral Map Preparation Methodology
		2ND		Unique identification number of parcel,Positions of existing Control Points and its types,Adjacent Boundaries and Features, Topology Creation and verification.
		3RD		PLANE TABLE SURVEYING : Objectives, principles and use of plane table surveying.
		4TH		Instruments & accessories used in plane table surveying.
		5TH	UNIT-V	Methods of plane table surveying – (1) Radiation, (2) Intersection (3) Traversing, (4) Resection.
	5TH	1ST		Statements of TWO POINT and THREE POINT PROBLEM.
		2ND		Errors in plane table surveying and their corrections, precautions in plane table surveying.
		3RD		THEODOLITE SURVEYING AND TRAVERSING: Purpose and definition of theodolite surveying,Transit theodolite- Description of features, component parts,
		4TH		Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
		5TH		Concept of transiting –Measurement of horizontal and vertical angles,Measurement of magnetic bearings, deflection angle, direct angle, setting out angles
MAY	1ST	1ST		Prolonging a straight line with theodolite, Errors in Theodolite observations.Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method
		3RD	UNIT-VI	Plotting the traverse by coordinate method, Checks for open and closed traverse,Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table
		4TH		Numerical problems on omitted measurement of lengths & bearings
		5TH		Closing error – adjustment of angular errors, adjustment of bearings,numerical problems
		2ND		Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse.problem solved.

Month	Week	Sub	Unit	Content
MAY	2ND	3RD		**LEVELLING AND CONTOURING :** Definition and Purpose and types of leveling,concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M.
		4TH		Instruments used for leveling,concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis
		5TH		Leveling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.
	3RD	2ND		Field data entry – level Book – height of collimation method and Rise & Fall method, comparison
		3RD		Numerical problems on reduction of levels applying both methods, Arithmetic checks
		4TH		Effects of curvature and refraction, numerical problems on application of correction.
		5TH	UNIT-VII	Reciprocal leveling – principles, methods, numerical problems, precise leveling.
	4TH	1ST		Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.
		2ND		
		3RD		Definitions, concepts and characteristics of contours
		4TH		Methods of contouring, plotting contour maps, Interpretation of contour maps, top sheets
		5TH		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
	5TH	2ND		Computation of volume of earthwork from contour map for simple structure.
		3RD		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
JUNE	1ST	4TH		**COMPUTATION OF AREA & VOLUME:** Determination of areas, computation of areas from plans.Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule
		5TH	UNIT-VIII	Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.
	2ND	1ST		QUESTION SOLVED
		2ND		REVISION
		3RD		REVISION
		4TH		PREVIOUS YEAR QUESTION DISCUSSION
		5TH		PREVIOUS YEAR QUESTION DISCUSSION

Subject Expert	HOD 10/03/22 Civil Department	Academic Co-ordinator