

GOVERNMENT POLYTECHNIC JAJPUR
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DEPARTMENT OF CIVIL ENGINEERING

LESSON PLAN

Discipline: Civil Engg	Semester: 4th	Name of the Teaching faculty: Er. SHIBASIS PANDA
Subject: Land Survey-I Th-3	No of Days/Week class allotted: 5 days	Semester from Date: 16/01/2024 To Date: 26/04/2024 No of weeks: 17
Week	Class Day	Topics
1st	1st	INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS
	2nd	Surveying: Definition
	3rd	Aims and objectives
	4th	Principles of survey-Plane surveying- Geodetic Surveying
	5th	Instrumental surveying.
2nd	1st	Precision and accuracy of measurements
	2nd	instruments used for measurement of distance
	3rd	Types of tapes and chains
	4th	Errors and mistakes in linear measurement
	5th	classification, Sources of errors and remedies
3rd	1st	Corrections to measured lengths due to-incorrect length
	2nd	temperature variation, pull, sag
	3rd	numerical problem applying corrections
	4th	CHAINING AND CHAIN SURVEYING
	5th	Equipment and accessories for chaining
4th	1st	Ranging – Purpose, signaling, direct and indirect ranging
	2nd	Line ranger – features and use, error due to incorrect ranging
	3rd	Methods of chaining –Chaining on flat ground
	4th	Chaining on sloping ground – stepping method,
	5th	Clinometer-features and use, slope correction
5th	1st	Setting perpendicular with chain & tape
	2nd	Chaining across different types of obstacles –Numerical problems on chaining across obstacles
	3rd	Purpose of chain surveying
	4th	Its principles, concept of field book
	5th	Selection of survey stations, base line, tie lines, Check lines
6th	1st	Offsets – Necessity, Perpendicular and Oblique offsets
	2nd	Instruments for setting offset – Cross Staff, Optical Square.
	3rd	Errors in chain surveying – compensating and accumulative errors causes & remedies
	4th	Precautions to be taken during chain surveying
	5th	ANGULAR MEASUREMENT AND COMPAS SURVEYING

7th	1st	Measurement of angles with chain, tape & compass
	2nd	Compass – Types, features, parts, merits & demerits
	3 rd	testing & adjustment of compass
	4 th	Designation of angles- concept of meridians – Magnetic, True, arbitrary
	5th	Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application, numerical problems on conversion of bearings
8th	1st	Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing
	2nd	Numerical problems on computation of interior & exterior angles from bearings
	3rd	Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination
	4th	numerical problems on application of correction for declination
	5th	Errors in angle measurement with compass – sources & remedies
9th	1st	Principles of traversing – open & closed traverse,
	2nd	Methods of traversing.
	3rd	Local attraction – causes, detection, errors, corrections
	4th	Numerical problems of application of correction due to local attraction
	5th	Errors in compass surveying – sources & remedies
10th	1st	Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table
	2nd	MAP READING CADASTRAL MAPS & NOMENCLATURE: Study of direction, Scale, Grid Reference and Grid Square
	3rd	Study of Signs and Symbols
	4th	Cadastral Map Preparation Methodology
		Unique identification number of parcels, Positions of existing Control Points and its types
11th	1st	Adjacent Boundaries and Features, Topology Creation and verification
	2nd	PLANE TABLE SURVEYING: Objectives, principles and use of plane table surveying.
	3rd	Instruments & accessories used in plane table surveying.
	4th	Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection
	5th	Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.
12th	1st	THEODOLITE SURVEYING AND TRAVERSING:
	2nd	Purpose and definition of theodolite surveying
	3rd	Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier
	4th	Temporary adjustment of theodolite
	5th	Concept of transiting –Measurement of horizontal and vertical angles
13th	1st	Measurement of magnetic bearings, deflection angle, direct angle
	2nd	setting out angles, prolonging a straight line with theodolite
	3rd	Errors in Theodolite observations
	4th	Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method

	5th	Plotting the traverse by coordinate method, Checks for open and closed traverse
14th	1st	Traverse computation – consecutive coordinates, latitude and departure, Gale’s traverse table
	2nd	Numerical problems on omitted measurement of lengths & bearings
	3rd	Closing error – adjustment of angular errors, adjustment of bearings, numerical problems
	4th	Balancing of traverse – Bowditch’s method, transit method, graphical method, axis method
	5th	calculation of area of closed traverse
15th	1st	LEVELLING AND CONTOURING: Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M.
	2nd	Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis
	3rd	Levelling staff – Temporary adjustments of level
	4th	taking reading with level, concept of bench mark, BS, IS, FS, CP, HI
	5th	Field data entry – level Book – height of collimation method and Rise & Fall method, comparison
16th	1 st	Numerical problems on reduction of levels applying both methods, Arithmetic checks.
	2 nd	Effects of curvature and refraction, numerical problems on application of correction
	3 rd	Reciprocal leveling – principles, methods, numerical problems, precise leveling
	4 th	Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels
	5 th	Definitions, concepts and characteristics of contours
17th	1 st	Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets
	2 nd	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
	3 rd	computation of volume of earthwork from contour map for simple structure. 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
	4 th	Determination of areas, computation of areas from plans. Calculation of area by using ordinate rule, trapezoidal rule, Simpson’s rule
	5th	Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes
18th	1st	CLASS TEST 3, PREVIOUS YEAR QUESTIONS, QUIZ

LearningResources:

Sl No.	Author Name	Name of the Book
1	Surveying and Levelling	R.Subramanian
2	Surveying, Vol.-I&II	Dr.B.C.Punmia.
3	A text Book of Surveying & Levelling	R. Agor

Er. Shibasis panda
FACULTY SIGNATURE