

Badriprasad Institute of Technology, Sambalpur

Lesson plan for Theory -3, Survey-I

Semester & Branch : 4th Sem Civil Engineering

Name of the faculty : Mrs. Sudipta Patel

Total Periods-60

No of periods /week-4

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

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6th	1st	Numerical problems on computation of interior & ,exterior angles from bearings.
	2nd	Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination,
	3rd	numerical problems on application of correction for declination.
	4th	Errors in angle measurement with compass – sources & remedies.
7th	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.
	4th	Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table
8th	1st	MAP READING CADASTRAL MAPS & NOMENCLATURE: Study of direction, Scale, Grid Reference and Grid Square
	2nd	Study of Signs and Symbols,Cadastral Map Preparation Methodology
	3rd	Unique identification number of parcel
	4th	Positions of existing Control Points and its types Adjacent Boundaries and Features, Topology Creation and verification.
9th	1st	PLANE TABLE SURVEYING : Objectives, principles and use of plane table surveying.Instruments & accessories used in plane table surveying.
	2nd	Methods of plane table surveying – (1) Radiation, (2) Intersection,
	3rd	(3) Traversing, (4) Resection.
	4th	Statements of TWO POINT
10th	1st	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
	4th	Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite

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11th	1st	Concept of transiting –Measurement of horizontal and vertical angles.
	2nd	Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.
	3rd	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.
	4th	Traverse computation – consecutive coordinates, latitude and departure, Gale’s traverse table, Numerical problems on omitted measurement of lengths & bearings
12th	1st	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.
	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.	
13th	1st	Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.
	2nd	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.
	3rd	Effects of curvature and refraction, numerical problems on application of correction.
	4th	Reciprocal leveling – principles, methods, numerical problems, precise leveling.
14th	1st	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.
	2nd	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
	3rd	Continue of 2nd Class
	4th	COMPUTATION OF AREA & VOLUME:
Determination of areas, computation of areas from plans.		

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15th	1st	Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.
	2nd	Continue of 1st Class
	3rd	Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.
	4th	Revision Class

Sign of Faculty

Sign of HOD