



NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)



LESSON PLAN

SUBJECT: Th-3 (LAND SURVEY – I)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	Introduction To Surveying, Linear Measurements	7	7
2	Chaining and Chain Surveying	7	7
3	Angular Measurement and Compas Surveying	12	12
4	Map Reading Cadastral Maps & Nomenclature	7	7
5	Plane Table Surveying	7	7
6	Theodolite Surveying and Traversing	15	15
7	Levelling and Contouring	15	15
8	Computation of Area & Volume	5	5
	Total Period:	75	75

Discipline: CIVIL ENGINEERING	Semester: 4 th	Name of the Teaching Faculty: Er. Sitikantha Barik
Week	Class Day	Theory / Practical Topics
1st	1st	1.1 Surveying: Definition, Aims and objectives
	2nd	1.2 Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying.
	3rd	1.3 Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains
	4th	1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies.
	5th	1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies.
2nd	1st	1.5 Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections.
	2nd	1.5 Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections.
	3rd	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.
	4th	2.3 Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction
	5th	2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles.

3rd	1st	2.5 Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines.
	2nd	2.5 Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines.
	3rd	2.7 Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square
	4th	2.8 Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying.
	5th	3.1 Measurement of angles with chain, tape & compass
4th	1st	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	3.3 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
	4th	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.
	5th	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.
	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	3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.

5 th	3 rd	3.6 Errors in angle measurement with compass – sources & remedies.
	4 th	3.7 Principles of traversing – open & closed traverse, Methods of traversing.
	5 th	3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction.
6 th	1 st	3.9 Errors in compass surveying – sources & remedies. Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table
	2 nd	4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols
	3 rd	4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols
	4 th	4.2 Cadastral Map Preparation Methodology
	5 th	4.3 Unique identification number of parcel
7 th	1 st	4.4 Positions of existing Control Points and its types
	2 nd	4.5 Adjacent Boundaries and Features, Topology Creation and verification.
	3 rd	4.5 Adjacent Boundaries and Features, Topology Creation and verification.
	4 th	5.1 Objectives, principles and use of plane table surveying.
	5 th	5.2 Instruments & accessories used in plane table surveying.
	1 st	5.3 Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection

8 th	2 nd	5.3 Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection
	3 rd	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.
	4 th	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.
	5 th	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.
9 th	1 st	6.1 Purpose and definition of theodolite surveying
	2 nd	6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
	3 rd	6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
	4 th	6.3 Concept of transiting –Measurement of horizontal and vertical angles
	5 th	6.3 Concept of transiting –Measurement of horizontal and vertical angles
10 th	1 st	6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.
	2 nd	6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.
	3 rd	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
	4 th	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
	5 th	6.6 Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings
	1 st	6.6 Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings

11 th	2 nd	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems
	3 rd	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems
	4 th	6.8 Balancing of traverse – Bowditch’s method, transit method, graphical method, axis method, calculation of area of closed traverse.
	5 th	6.8 Balancing of traverse – Bowditch’s method, transit method, graphical method, axis method, calculation of area of closed traverse.
12 th	1 st	7.1 Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M.
	2 nd	7.2 Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.
	3 rd	7.3 Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.
	4 th	7.4 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.
	5 th	7.5 Effects of curvature and refraction, numerical problems on application of correction.
13 th	1 st	7.6 Reciprocal leveling – principles, methods, numerical problems, precise leveling.
	2 nd	7.7 Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.
	3 rd	7.7 Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.
	4 th	7.8 Definitions, concepts and characteristics of contours
	5 th	7.9 Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets.
	1 st	7.9 Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets.
	2 nd	7.10 Use of contour maps on civil engineering projects – drawing crosssections 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	3rd	7.10 Use of contour maps on civil engineering projects – drawing crosssections 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
	4th	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
	5th	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
15th	1st	8.1 Determination of areas, computation of areas from plans.
	2nd	8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule
	3rd	8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule
	4th	8.3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.
	5th	8.3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.