

**ACADEMIC SESSION: SUMMER-2024**

<b>Discipline</b> :Civil engg	<b>Semester: 4th</b>	<b>Name of the Teaching Faculty : Subhasmita behera</b>
<b>Subject: Land Survey-I</b>	<b>No. of Days / Week class allotted: 5</b>	<b>Semester Duration: 16/01/2024 to 26/04/2024</b>  <b>No. of Weeks : 15</b>
<b>Week</b>	<b>Class day</b>	<b>Theory/Practical Topics:</b>
<b>1<sup>st</sup></b>	<b>1<sup>st</sup></b>	Surveying: Definition, Aims and objectives
	<b>2<sup>nd</sup></b>	Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying.
	<b>3<sup>rd</sup></b>	Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains.
	<b>4<sup>th</sup></b>	Errors and mistakes in linear measurement – classification
	<b>5<sup>th</sup></b>	Sources of errors and remedies.
<b>2<sup>nd</sup></b>	<b>1<sup>st</sup></b>	Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag
	<b>2<sup>nd</sup></b>	numerical problem applying corrections
	<b>3<sup>rd</sup></b>	Equipment and accessories for chaining
	<b>4<sup>th</sup></b>	Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging.
	<b>5<sup>th</sup></b>	Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.
<b>3<sup>rd</sup></b>	<b>1<sup>st</sup></b>	Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles.
	<b>2<sup>nd</sup></b>	Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines.
	<b>3<sup>rd</sup></b>	Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square.
	<b>4<sup>th</sup></b>	Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying.
	<b>5<sup>th</sup></b>	Measurement of angles with chain, tape & compass



4th	1 <sup>st</sup>	Compass – Types, features, parts, merits & demerits
	2 <sup>nd</sup>	Testing & adjustment of compass
	3 <sup>rd</sup>	Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application,
	4 <sup>th</sup>	numerical problems on conversion of bearings
	5 <sup>th</sup>	Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing
5 <sup>th</sup>	1 <sup>st</sup>	Numerical problems on computation of interior & exterior angles from bearings.
	2 <sup>nd</sup>	Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.
	3 <sup>rd</sup>	Errors in angle measurement with compass – sources & remedies.
	4 <sup>th</sup>	Principles of traversing – open & closed traverse, Methods of traversing.
	5 <sup>th</sup>	Local attraction – causes, detection, errors, corrections
6 <sup>th</sup>	1 <sup>st</sup>	Numerical problems of application of correction due to local attraction.
	2 <sup>nd</sup>	Errors in compass surveying – sources & remedies.
	3 <sup>rd</sup>	Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table
	4 <sup>th</sup>	Study of direction, Scale, Grid Reference
	5 <sup>th</sup>	Grid Square Study of Signs and Symbols
7 <sup>th</sup>	1 <sup>st</sup>	Cadastral Map Preparation Methodology
	2 <sup>nd</sup>	Unique identification number of parcel
	3 <sup>rd</sup>	Positions of existing Control Points and its types
	4 <sup>th</sup>	Adjacent Boundaries and Feature
	5 <sup>th</sup>	Topology Creation and verification.
8 <sup>th</sup>	1 <sup>st</sup>	Objectives, principles and use of plane table surveying.
	2 <sup>nd</sup>	Instruments & accessories used in plane table surveying.



	3 <sup>rd</sup>	Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection. Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.
	4 <sup>th</sup>	
	5 <sup>th</sup>	
	1 <sup>st</sup>	
	2 <sup>nd</sup>	
9 <sup>th</sup>	3 <sup>rd</sup>	Transit theodolite- Description of features, component parts
	4 <sup>th</sup>	Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite
	5 <sup>th</sup>	Concept of transiting – Measurement of horizontal and vertical angles.
	1 <sup>st</sup>	Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite
	2 <sup>nd</sup>	Errors in Theodolite observations.
10 <sup>th</sup>	3 <sup>rd</sup>	Methods of theodolite traversing with – inclined angle method
	4 <sup>th</sup>	deflection angle method, bearing method, Plotting the traverse by coordinate method
	5 <sup>th</sup>	Checks for open and closed traverse.
	1 <sup>st</sup>	Numerical problem
	2 <sup>nd</sup>	Traverse computation – consecutive coordinates
11 <sup>th</sup>	3 <sup>rd</sup>	latitude and departure
	4 <sup>th</sup>	Gale's traverse table
	5 <sup>th</sup>	Numerical problems on omitted measurement of lengths & bearings
	1 <sup>st</sup>	Closing error – adjustment of angular errors,
	2 <sup>nd</sup>	adjustment of bearings, numerical problems
12 <sup>th</sup>	3 <sup>rd</sup>	Balancing of traverse – Bowditch's method
	4 <sup>th</sup>	transit method, graphical method
	5 <sup>th</sup>	axis method, calculation of area of closed traverse
	1 <sup>st</sup>	Numerical problem
	2 <sup>nd</sup>	Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M.
13 <sup>th</sup>	3 <sup>rd</sup>	Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.
	4 <sup>th</sup>	



	3 <sup>rd</sup>	Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.
	4 <sup>th</sup>	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 <sup>th</sup>	Effects of curvature and refraction, numerical problems on application of correction.
14 <sup>th</sup>	1 <sup>st</sup>	Reciprocal leveling – principles, methods, numerical problems, precise leveling.
	2 <sup>nd</sup>	Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.
	3 <sup>rd</sup>	Definitions, concepts and characteristics of contours.
	4 <sup>th</sup>	Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets.
	5 <sup>th</sup>	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.
15 <sup>th</sup>	1 <sup>st</sup>	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
	2 <sup>nd</sup>	Determination of areas, computation of areas from plans.
	3 <sup>rd</sup>	Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.
	4 <sup>th</sup>	Calculation of volumes by prismoidal formula and trapezoidal formula
	5 <sup>th</sup>	Prismoidal corrections, curvature correction for volumes

*S. Behera*  
16/01/24  
Prepared By :

Approved By:

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18/01/24  
HOD(Civil)