

## LESSON PLAN FOR SURVEYING -1

<b>Discipline</b> Civil Engg.	<b>Semester:</b> 4 <sup>th</sup>	<b>Name of teaching faculty:</b> RICHA SETH
Subject: SURVEYING-1	Nos of days per week class allotted: 5	Semester from date:9.12.19 to date:31.03.20
<b>Week</b>	<b>Class day</b>	<b>Theory topics</b>
DEC 2 <sup>ND</sup> Week	1 <sup>ST</sup>	Surveying: Definition, Aims and objectives
	2 <sup>ND</sup>	Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying.
	3 <sup>RD</sup>	Precision and accuracy of measurements, instruments used for measurement of distance,
	4 <sup>th</sup>	Types of tapes and chains.
	5 <sup>th</sup>	Errors and mistakes in linear measurement – classification, Sources of errors and remedies.
DEC 3 <sup>rd</sup> Week	1 <sup>ST</sup>	Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag,
	2 <sup>ND</sup>	numerical problem applying corrections
	3 <sup>RD</sup>	<b>CHAINING AND CHAIN SURVEYING :</b> 2.1 Equipment and accessories for chaining
	4 <sup>TH</sup>	Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging.
	5 <sup>TH</sup>	Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction
January 1 <sup>st</sup> week	1 <sup>ST</sup>	Setting perpendicular with chain & tape,
	2 <sup>ND</sup>	Chaining across different types of obstacles –
	3 <sup>rd</sup>	Numerical problems on chaining across obstacles
	4 <sup>th</sup>	Purpose of chain surveying, Its Principles, concept of field book
	5 <sup>th</sup>	Selection of survey stations, base line, tie lines, Check lines
January 2 <sup>nd</sup> week	1 <sup>ST</sup>	Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square.
	2 <sup>ND</sup>	Errors in chain surveying – compensating and accumulative errors causes &

		remedies, Precautions to be taken during chain surveying.
	3 <sup>RD</sup>	<b>ANGULAR MEASUREMENT AND COMPAS SURVEYING :</b>
	4 <sup>TH</sup>	3.1 Measurement of angles with chain, 3.1 Measurement of angles tape & compass
	5 <sup>TH</sup>	Compass – Types, features, parts, merits & demerits, testing & adjustment of compass
January 3rd week	1 <sup>ST</sup>	Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings
	2 <sup>ND</sup>	Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application
	3 <sup>RD</sup>	numerical problems on conversion of bearings
	4 <sup>TH</sup>	Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing
	5 <sup>TH</sup>	Numerical problems on computation of interior & exterior angles from bearings.
January 4th week	1 <sup>ST</sup>	Effects of earth's magnetism – dip of needle
	2 <sup>ND</sup>	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
	5 <sup>TH</sup>	Local attraction – causes, detection, errors, corrections
January 5th week	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,
	4 <sup>th</sup>	Bowditch's correction, Gales table
	5 <sup>th</sup>	<b>MAP READING CADASTRAL MAPS &amp; NOMENCLATURE:</b>
February 2nd week	1 <sup>ST</sup>	4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols
	2 <sup>ND</sup>	Cadastral Map Preparation Methodology

	3 <sup>RD</sup>	Positions of existing Control Points and its types
	4 <sup>TH</sup>	Adjacent Boundaries and Features, Topology Creation and verification
	5 <sup>TH</sup>	<b>PLANE TABLE SURVEYING :</b> 5.1 Objectives, principles and use of plane table surveying
February 3rd week	1 <sup>ST</sup>	Instruments & accessories used in plane table surveying.
	2 <sup>ND</sup>	Methods of plane table surveying
	3 <sup>RD</sup>	Statements of TWO POINT and THREE POINT PROBLEM.
	4 <sup>TH</sup>	Errors in plane table surveying and their corrections, precautions in plane table surveying.
February 4th week	1 <sup>ST</sup>	<b>THEODOLITE SURVEYING AND TRAVERSING:</b> Purpose and definition of theodolite surveying
	2 <sup>ND</sup>	Transit theodolite- Description of features, component parts
	3 <sup>RD</sup>	Concept of transiting –Measurement of horizontal and vertical angles.
	4 <sup>th</sup>	Measurement of magnetic bearings, deflection angle, direct angle
	5 <sup>th</sup>	Errors in Theodolite observations.
February 5th week	1 <sup>ST</sup>	Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method,
	2 <sup>ND</sup>	Checks for open and closed traverse.
	3 <sup>RD</sup>	Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings
	4 <sup>TH</sup>	Closing error – adjustment of angular errors, adjustment of bearings, numerical problems
	5 <sup>TH</sup>	Balancing of traverse – Bowditch's method
March 1st week	1 <sup>ST</sup>	transit method, graphical method, axis method, calculation of area of closed traverse
	2 <sup>ND</sup>	<b>LEVELLING AND CONTOURING :</b> 7.1 Definition and Purpose and types of leveling– concepts of level surface,
	3 <sup>RD</sup>	Horizontal surface, vertical surface, datum, R. L., B.M
	4 <sup>TH</sup>	Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.
	5 <sup>TH</sup>	Levelling staff – Temporary adjustments of level, taking

		reading with level, concept of bench mark, BS, IS, FS, CP, HI
March 2 <sup>nd</sup> week	1 <sup>ST</sup>	height of collimation method and Rise & Fall method, comparison, Numerical problems on reduction of levels applying both methods, Arithmetic checks.
	2 <sup>ND</sup>	Effects of curvature and refraction, numerical problems on application of correction.
	3 <sup>RD</sup>	Reciprocal levelling
	4 <sup>th</sup>	Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.
March 3 <sup>rd</sup> week	1 <sup>ST</sup>	Definitions, concepts and characteristics of contours
	2 <sup>ND</sup>	Methods of contouring, plotting contour maps, Interpretation of contour maps,
	3 <sup>RD</sup>	Use of contour maps on civil engineering projects
	4 <sup>TH</sup>	Map Interpretation: Interpret Human and Economic Activities (i.e.: Settlement, Communication, Land use etc.)
	5 <sup>TH</sup>	Interpret Physical landform (i.e.: Relief, Drainage Pattern etc.), Problem Solving and Decision Making
March 4 <sup>th</sup> week	1 <sup>ST</sup>	<b>COMPUTATION OF AREA &amp; VOLUME:</b> 8.1 Determination of areas, computation of areas from plans.
	2 <sup>ND</sup>	Calculation of area by using ordinate rule, trapezoidal rule,
	3 <sup>RD</sup>	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