

# LESSON PLAN OF 4<sup>th</sup> SEMESTER (2019-22) CIVIL ENGINEERING

Discipline :- <b>CIVIL ENGG</b>	Semester:- <b>4<sup>th</sup></b>	Name of the Teaching Faculty:- <b>NISHANT BHANJADEO</b>
Subject:- <b>THEORY SURVEY 1 (TH-3)</b>	No of Days per Week Class Allotted :- <b>5</b>	Semester From:- <b>19<sup>th</sup> April 2021</b> To:- <b>13<sup>th</sup> August 2021</b>
<b>Week</b>	<b>Class Day</b>	<b>No of Weeks:- 17</b>
		<b>Theory</b>
<b>1<sup>st</sup></b>	<b>1<sup>st</sup></b>	<b>1.0 INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS:</b> 1.1 Surveying: Definition, Aims and objectives
	<b>2<sup>nd</sup></b>	1.2 Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying
	<b>3<sup>rd</sup></b>	1.3 Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains. ,
	<b>4<sup>th</sup></b>	1.3 Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains. ,
	<b>5<sup>th</sup></b>	1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies
<b>2<sup>nd</sup></b>	<b>1<sup>st</sup></b>	1.5 Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections
	<b>2<sup>nd</sup></b>	<b>2.0 CHAINING AND CHAIN SURVEYING:</b> 2.1 Equipment and accessories for chaining
	<b>3<sup>rd</sup></b>	2.2 Ranging – Purpose, signalling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging
	<b>4<sup>th</sup></b>	2.2 Ranging – Purpose, signalling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging
	<b>5<sup>th</sup></b>	2.3 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>	2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles
	<b>2<sup>nd</sup></b>	2.5 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>	2.6 Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square.
	<b>4<sup>th</sup></b>	2.7 Cross Staff, Optical Square
	<b>5<sup>th</sup></b>	2.8 Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying.
<b>4<sup>th</sup></b>	<b>1<sup>st</sup></b>	<b>3.0 ANGULAR MEASUREMENT AND COMPAS SURVEYING :</b> 3.1 Measurement of angles with chain, tape & compass
	<b>2<sup>nd</sup></b>	3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass
	<b>3<sup>rd</sup></b>	3.3 Designation of angles- concept of meridians – Magnetic, True, arbitrary;
	<b>4<sup>th</sup></b>	Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application, numerical problems on conversion of bearings
	<b>5<sup>th</sup></b>	Numerical on Bearing
<b>5<sup>th</sup></b>	<b>1<sup>st</sup></b>	3.4 Use of compasses – setting in field-centering, levelling, taking readings, concepts of Fore bearing, Back Bearing, Numerical problems on computation of interior & exterior angles from bearings
	<b>2<sup>nd</sup></b>	3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.
	<b>3<sup>rd</sup></b>	3.6 Errors in angle measurement with compass – sources & remedies
	<b>4<sup>th</sup></b>	3.7 Principles of traversing – open & closed traverse, Methods of traversing.
	<b>5<sup>th</sup></b>	Methods of Traversing

6 <sup>th</sup>	1 <sup>st</sup>	3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction
	2 <sup>nd</sup>	3.9 Errors in compass surveying – sources & remedies. Plotting of traverse – check of closing error in closed & open traverse
	3 <sup>rd</sup>	Bowditch's correction, Gales table
	4 <sup>th</sup>	Numerical on Bowditch's correction
	5 <sup>th</sup>	Revision and numerical
7 <sup>th</sup>	1 <sup>st</sup>	<b>4.0 MAP READING CADASTRAL MAPS &amp; NOMENCLATURE:</b> 4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols 4.2 Cadastral Map Preparation Methodology
	2 <sup>nd</sup>	4.3 Unique identification number of parcel 4.4 Positions of existing Control Points and its types
	3 <sup>rd</sup>	4.5 Adjacent Boundaries and Features, Topology Creation and verification.
	4 <sup>th</sup>	<b>5.0 PLANE TABLE SURVEYING :</b> 5.1 Objectives, principles and use of plane table surveying
	5 <sup>th</sup>	5.2 Instruments & accessories used in plane table surveying
8 <sup>th</sup>	1 <sup>st</sup>	5.3 Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection.
	2 <sup>nd</sup>	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying
	3 <sup>rd</sup>	5.5 Photogrammetry Process: 5.6 Acquisition of Imagery using aerial and satellite platform
	4 <sup>th</sup>	<b>6.0 THEODOLITE SURVEYING AND TRAVERSING:</b> 6.1 Purpose and definition of theodolite surveying
	5 <sup>th</sup>	6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier
9 <sup>th</sup>	1 <sup>st</sup>	Temporary adjustment of theodolite .
	2 <sup>nd</sup>	6.3 Concept of transiting –Measurement of horizontal and vertical angles.
	3 <sup>rd</sup>	6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations
	4 <sup>th</sup>	6.5 Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method,
	5 <sup>th</sup>	Plotting the traverse by coordinate method, Checks for open and closed traverse.
10 <sup>th</sup>	1 <sup>st</sup>	6.6 Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table,
	2 <sup>nd</sup>	Numerical problems on omitted measurement of lengths & bearings.
	3 <sup>rd</sup>	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems
	4 <sup>th</sup>	6.8 Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse
	5 <sup>th</sup>	calculation of area of closed traverse
11 <sup>th</sup>	1 <sup>st</sup>	<b>7.0 LEVELLING AND CONTOURING:</b> 7.1 Definition and Purpose and types of levelling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M
	2 <sup>nd</sup>	7.2 Instruments used for levelling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis
	3 <sup>rd</sup>	7.3 Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.
	4 <sup>th</sup>	7.4 Field data entry – level Book – height of collimation method and Rise & Fall method, comparison.
	5 <sup>th</sup>	Numerical problems on reduction of levels applying both methods, Arithmetic checks



12 <sup>th</sup>	1 <sup>st</sup>	7.5 Effects of curvature and refraction, numerical problems on application of correction.
	2 <sup>nd</sup>	7.6 Reciprocal levelling – principles, methods, numerical problems, precise levelling.
	3 <sup>rd</sup>	7.7 Errors in levelling and precautions, Permanent and temporary adjustments of different types of levels.
	4 <sup>th</sup>	7.8 Definitions, concepts and characteristics of contours
	5 <sup>th</sup>	7.9 Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets.
13 <sup>th</sup>	1 <sup>st</sup>	7.10 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
	2 <sup>nd</sup>	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.),
	3 <sup>rd</sup>	Problem Solving and Decision Making
	4 <sup>th</sup>	<b>8.0 COMPUTATION OF AREA &amp; VOLUME:</b>
	5 <sup>th</sup>	8.1 Determination of areas, computation of areas from plans
14 <sup>th</sup>	1 <sup>st</sup>	8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule
	2 <sup>nd</sup>	8.3 Calculation of volumes by prismoidal formula and trapezoidal formula,
	3 <sup>rd</sup>	Prismoidal corrections, curvature correction for volumes
	4 <sup>th</sup>	Numerical on corrections
	5 <sup>th</sup>	Numerical on Rise and fall method
15 <sup>th</sup>	1 <sup>st</sup>	Numerical on Rise and fall method
	2 <sup>nd</sup>	Numerical on Bowditch's correction
	3 <sup>rd</sup>	Numerical on Bearing
	4 <sup>th</sup>	Doubt clearing class
16 <sup>th</sup>	1 <sup>st</sup>	Revision Class
	2 <sup>nd</sup>	
	3 <sup>rd</sup>	
	4 <sup>th</sup>	
	5 <sup>th</sup>	
17 <sup>th</sup>	1 <sup>st</sup>	Revision class
	2 <sup>nd</sup>	
	3 <sup>rd</sup>	
	4 <sup>th</sup>	
	5 <sup>th</sup>	

Signature of the concerned Lecturer

Signature of the H.O.D

Signature of Academic Coordinator

Signature of the Principal

G.p, Puri