LESSON PLAN

Name of the Faculty	**GAURAV**
Discipline	**Civil Engineering**
Semester	**4th**
Subject	**Surveying-II**
Lesson Plan Duration	**15Week (from Jan 2026 to May 2026)**

WEEK	THEORY		PRACTICAL	
	LECTURE DAY	TOPIC	PRACTICAL	TOPIC
1	1	Electronic Digital Theodolite and Tachometric surveying 1.1 Concept/Difference of Transit Theodolite and Electronic Digital Theodolite	1	I. Digital Theodolite: i) Study of a transit vernier theodolite; temporary adjustments of theodolite
	2	Temporary adjustments of an Electronic Digital Theodolite, Concept of transiting, swinging, face left, face right and changing face.	2	Revision
2	3	Prolonging a line (forward and backward)	3	ii) Reading the Vernier and working out the least count, measurement of horizontal angles by repetition and reiteration methods
	4	Traversing by included angles and deflection angle method	4	Revision
3	5	Plotting a traverse; concept of coordinate and solution of omitted measurements (one side affected)	5	iii) Measurement of vertical angles and use of tachometric tables iv) Measurement of magnetic bearing of a line
	6	Errors in theodolite survey and precautions taken to minimize them : Height of objects with and without accessible bases	6	vi) Running a closed traverse with a theodolite (at least five sides) and its plotting
4	7	Concept, general principles of stadia tachometry and methods of tachometry and (with numerical problems) 1.9 Instruments to be used in tachometry	7	v) Height of objects with and without accessible bases
	8	Revision	8	Revision
5	9	Curves: (Horizontal, Vertical and Transition Curve) Definition and types of horizontal curve Elements of simple circular curve - Degree of the curve, radius of the curve, tangent length, point of intersection	9	Revision
	10	(Apex point) tangent point, length of curve, long chord deflection angle, Apex distance and Mid-ordinate. (With numerical problems)	10	Revision
6	11	Transition Curve: 2.2.1 Definition of transition curve 2.2.2 Requirements of transition curve	11	Revision
	12	Length of transition curve for roads; by cubic parabola 2.2.4 Need (centrifugal force and super elevation). 2.2.5 Calculation of offsets for a transition curve	12	Curves i) Setting out of a simple circular curve with given data by the following methods
7	13	Definition and types of vertical curve;Types of vertical curves Setting out of a vertical curve	13	b) One theodolite method
	14	Revision	14	Setting out of simple circular curve by tangential angles using a Digital Theodolite.
8	15	Introduction of Advanced Surveying Equipment and Techniques.3.1 Principle of EDM, its component parts and their functions 3.2 Uses of EDM3.3 Distomat	15	Setting out of a transition curve by tangential offsets using a Digital Theodolite.
	16	3.4 Remote sensing system 3.5 Application of remote sensing system in civil engineering, land uses/land cover,mapping, and disaster management	16	Revision
		3.6GPS, DGPS and GIS applications and software used		Revision

9	17	(introduction only) 3.7 Planimeter (Digital)	17	Revision
	18	Introduction of Drones Survey	18	Revision
10	19	Revision	19	Revision
	20	Revision	20	Revision
11	21	Total Station (TS) 4.1 Concept and uses of TS 4.2 Uses of function keys, various parts of TS	21	Total Station i) Temporary adjustments of a TS
	22	4.3 Accessories used in TS survey 4.4 Applications of TS in various engineering area.	22	ii) Measurement of distance, horizontal angle and vertical angle.
12	23	4.5 Temporary adjustments of TS 4.6 Measurement of horizontal angle, vertical angle distance and coordinates using Total station, Traversing, profile survey and contouring with TS	23	iii) To plot an area with the help of Total Station
	24	Errors in TS 4.8 Layout of any building, school, college, factory etc. with total station showing topographic map also	24	iv) Layout of any building, school, college, factory etc. with total station showing topographic map also
13	25	Revision	25	DGPS (Differential Global Positioning System) i) Computation of earth work and reservoir capacity with DGPS ii) Layout of drain, canal, road with DGPS.
	26	Revision	26	iii) Demarcation of roads, plots, commercial spaces and agricultural land etc.with DGPS
14	27	DGPS (Differential Global Positioning System) 5.1 Concept of DGPS, various parts, applications and software used for DGPS 5.2 Comparison between DGPS and TS	27	iv) Periodic field visits to Survey of India and other government agencies.
	28	5.3 Temporary adjustments of a DGPS 5.4 How does DGPS work	28	Revision
15	29	5.5 Errors in DGPS 5.6 Periodic field visits to Survey of India and other government agencies. 5.7 Layout of drain, canal, road with DGPS.	29	Revision
	30	5.8 Demarcation of roads, plots, commercial spaces and agricultural land etc.with DGPS	30	Revision
16	31	Revision	31	Revision
	32	Revision	32	Revision