

**Lesson Plan – Land Survey II**  
**Programme: Diploma in Civil Engineering**

Semester: 6th Semester

Course: Land Survey – II

Session-Summer-2026

Total Classes: 75 | Periods per Week: 5

Faculty: Sri Amit Kumar Sahu, Sri Manaranjan Patra

Class No.	Unit	Topic	Exact Sub-topic	Teaching Method	Teaching Aids	CO
1	I	Tacheometry	Introduction to tacheometry and its applications	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
2	I	Tacheometry	Principle of stadia tacheometry	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
3	I	Tacheometry	Stadia constants - multiplying and additive constants	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
4	I	Tacheometry	Determination of stadia constants by field method	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
5	I	Tacheometry	Staff held vertical - horizontal line of sight	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
6	I	Tacheometry	Numerical problems on horizontal sight	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
7	I	Tacheometry	Inclined line of collimation - fundamentals	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
8	I	Tacheometry	Distance calculation for inclined sight	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
9	I	Tacheometry	Elevation determination for inclined sight	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
10	I	Tacheometry	Numerical problems on inclined sight	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
11	I	Tacheometry	Determination of RL of staff stations	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
12	I	Tacheometry	Revision and problem solving	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
13	II	Curves	Introduction to curves and their necessity	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
14	II	Curves	Simple circular curve - definition and	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1

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			terminology			
15	II	Curves	Compound curve - purpose and field applications	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
16	II	Curves	Reverse curve - purpose and field applications	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
17	II	Curves	Transition curve - purpose and types	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
18	II	Curves	Elements of simple circular curve	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
19	II	Curves	Numerical problems on curve elements	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
20	II	Curves	Preparation of curve table	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
21	II	Curves	Setting out curve by offsets from long chord	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
22	II	Curves	Setting out curve by successive bisection of arc	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
23	II	Curves	Setting out curve by offsets from tangents	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
24	II	Curves	Setting out curve by offsets from chord produced	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
25	II	Curves	Rankine's method of deflection angles	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
26	II	Curves	Obstacles in curve ranging - theory	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
27	II	Curves	Curve ranging when point of intersection is inaccessible	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO1
28	III	Scales & Maps	Introduction to scales in surveying	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
29	III	Scales & Maps	Representative Fraction (RF) scale	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
30	III	Scales & Maps	Construction of linear scale	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
31	III	Scales & Maps	Construction of graphical scale	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
32	III	Scales & Maps	Introduction to maps	Lecture / Demonstration	BB, PPT, Instruments	CO2

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33	III	Scales & Maps	Map scale and map projections	Lecture / Demonstration	/ Maps BB, PPT, Instruments / Maps	CO2
34	III	Scales & Maps	Representation of location and extent	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
35	III	Scales & Maps	Representation of spatial relationships	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
36	IV	Survey of India Maps	Survey of India - role and map series	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
37	IV	Survey of India Maps	Open Series Map - features and uses	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
38	IV	Survey of India Maps	Defence Series Map - features and uses	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
39	IV	Survey of India Maps	Map nomenclature and quadrangle system	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
40	IV	Survey of India Maps	Latitude and longitude system	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
41	IV	Survey of India Maps	UTM grid system	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
42	IV	Survey of India Maps	Contour lines and their characteristics	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
43	IV	Survey of India Maps	Magnetic declination and field notes	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO2
44	V	Aerial Photography & Photogrammetry	Introduction to aerial photography	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO3
45	V	Aerial Photography & Photogrammetry	Types of aerial photographs - vertical and oblique	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO3
46	V	Aerial Photography & Photogrammetry	Film, focal length and scale of photographs	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO3
47	V	Aerial Photography & Photogrammetry	Introduction to photogrammetry	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO3
48	V	Aerial Photography & Photogrammetry	Classification of photogrammetry	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO3
49	V	Aerial Photography & Photogrammetry	Aerial photogrammetry - principles	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO3
50	V	Aerial Photography & Photogrammetry	Terrestrial photogrammetry - principles	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO3

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51	V	Aerial Photography & Photogrammetry	Imagery acquisition using aerial platforms	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO3
52	V	Aerial Photography & Photogrammetry	Geometric distortions in imagery	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO3
53	V	Aerial Photography & Photogrammetry	Orientation and triangulation	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO3
54	V	Aerial Photography & Photogrammetry	Stereoscopic vision and parallax	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO3
55	V	Aerial Photography & Photogrammetry	X-parallax and Y-parallax applications	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO3
56	VI	Modern Surveying	Introduction to modern surveying instruments	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO4
57	VI	Modern Surveying	Micro-optic theodolite - features and uses	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO4
58	VI	Modern Surveying	Digital theodolite - features and advantages	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO4
59	VI	Modern Surveying	Introduction to Total Station	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO4
60	VI	Modern Surveying	Components of Total Station	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO4
61	VI	Modern Surveying	Measurement of angles using Total Station	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO4
62	VI	Modern Surveying	Measurement of distances using Total Station	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO4
63	VI	Modern Surveying	Coordinate determination using Total Station	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO4
64	VII	GPS, DGPS & ETS	Introduction to GPS	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO4
65	VII	GPS, DGPS & ETS	Working principle of GPS	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO4
66	VII	GPS, DGPS & ETS	GPS signals and segments	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO4
67	VII	GPS, DGPS & ETS	Errors in GPS measurements	Lecture / Demonstration	BB, PPT, Instruments / Maps	CO4
68	VII	GPS, DGPS & ETS	Positioning methods in GPS	Lecture / Demonstration	BB, PPT, Instruments	CO4

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69	VII	GPS, DGPS & ETS	Introduction to DGPS	Lecture / Demonstration	/ Maps BB, PPT, Instruments	CO4
70	VII	GPS, DGPS & ETS	DGPS base station and rover setup	Lecture / Demonstration	/ Maps BB, PPT, Instruments	CO4
71	VII	GPS, DGPS & ETS	DGPS data download and post-processing	Lecture / Demonstration	/ Maps BB, PPT, Instruments	CO4
72	VIII	GIS	Introduction to GIS	Lecture / Demonstration	/ Maps BB, PPT, Instruments	CO4
73	VIII	GIS	Components of GIS	Lecture / Demonstration	/ Maps BB, PPT, Instruments	CO4
74	VIII	GIS	Spatial and attribute data models	Lecture / Demonstration	/ Maps BB, PPT, Instruments	CO4
75	VIII	GIS	Map preparation and layout in ArcMap	Lecture / Demonstration	/ Maps BB, PPT, Instruments	CO4

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