List of Laboratory Experiments

SURVEYING LABORATORY

Course Code	Hours / Week				Maximum Marks		
	L	T	P	C	CIA	SEE	Total
CEPC-307	0	0	2	1	60	40	100

Number of classes: 25 Hours	**Prerequisites: Civil Engineering Drawing**
Branch: CE(CT)	**Semester: III**

Course overview:

The Surveying Laboratory is an essential part of the civil engineering curriculum that provides practical training in the measurement of land and construction site features. The lab focuses on the use of both conventional and modern surveying instruments to perform fieldwork necessary for planning, design, and execution of civil engineering projects. Students will gain hands-on experience with instruments such as the chain, compass, plane table, theodolite, total station, and GPS. The course emphasizes accuracy in measurement, data recording, and map preparation.

Course objectives:

I. To introduce the basic principles and methods of land surveying.
II. To provide practical knowledge of handling various surveying instruments.
III. To develop skills in conducting field surveys and recording data accurately.
IV. To prepare maps, plans, and cross-sections from field observations.
V. To apply surveying techniques in real-world civil engineering projects such as road alignment, boundary marking, and contour mapping.

Course outcomes:

CO Number	CO Description	K-level
CO-1	Select the type of survey required for given situation.	K-1
CO-2	Compute area of open field using chain, tape and cross staff and Conduct traversing in the field using chain and compass.	K-2
CO-3	Use levelling instruments to determine reduced level for preparation of contour maps and use digital planimeter to calculate the areas.	K-3
CO-4	Prepare plans using Plane Table Surveys, Compute horizontal angle and vertical angle using Theodolite and illustrate the use of Total Station.	K-3
CO-5	Solve problems related to simple curve and Compute constants of tacheometer, horizontal and vertical distances.	K-3
CO-6	Find distances and elevations using Tachometer and Locate coordinates of stations and discuss the use and functions of GPS and GIS.	K-3
Sl. No.	**MODULE**	**CO**

1.	Measure distance between two survey stations using chain, tape and ranging rods when two stations are inter visible.	CO-1
2.	Undertake reciprocal ranging and measure the distance between two stations.	CO-1
3.	3 Determine area of open field using chain and cross staff survey	CO-2
4.	Measure Fore Bearing and Back Bearing of survey lines of open traverse and closed traverse of 5 or 6 sides using Prismatic Compass and correct the bearings and included angles for the local attraction	CO-2
5.	Undertake Survey Project with chain and compass for closed traverse for minimum 5 sides around a buildingand Plot the traverse on A1 size imperial drawing sheet for data collected	CO-2
6.	Undertake simple leveling using dumpy level/ Auto level and leveling staff.	CO-3
7.	Undertake fly leveling with double check using dumpy level/ Auto level and leveling staff	CO-3
8.	Undertake Survey Project with Leveling instrument for Profile leveling and cross sectioning for a road length of 500 m with cross-section at 30 m interval.	CO-3
9.	Undertake Survey Project with Leveling instrument for Profile leveling and cross sectioning for a road length of 500 m with cross-section at 30 m interval.	CO-3
10.	Undertake Survey Project for plotting contour map using block contouring method for a block of 150m x 150m with grid of 10m x 10m	CO-3
11.	Measure area of irregular figure using Digital planimeter	CO-3
12	Use plane table survey to prepare plans of a plot of seven sided closed traverse by Radiation Method, Intersection Method and Traversing Method	CO-4
13	Use plane table survey to carry out Survey Project for closed traverse for minimum five sides around a building	CO-4
14.	Use transit theodolite to measure Horizontal and Vertical angle by Direct Method and Plot the traverse on A1 size imperial drawing sheet for the collected data.	CO-4
15.	Use Thedolite as a Tacheometer to compute reduced levels and horizontal distances.	CO-5
16.	Use micro optic Theodolite to Measure Horizontal angle by Direct Method	CO-5
17.	Use EDM to measure horizontal distance	CO-5
18.	Use Total station instrument to measure horizontal distances and vertical angle.	CO-4
19.	Use Total station instrument to carry out Survey Project for closed traverse for minimum five sides and Plot the traverse on A1 size imperial drawing sheet for the collected data.	CO-4

20.	Use GPS to locate the coordinates of a station.	CO-6