

25UCEL305	SURVEY LAB	Category	L	T	P	R	Credit	Year of Introduction
		PCL	0	0	3	0	2	2025

Preamble: This course imparts practical experience to students by exposing them to various techniques of field surveying. The course is designed to make student familiar with conventional and advanced surveying instruments.

Prerequisite: Nil

Course Outcomes: After the completion of the course, the student will be able to:

CO	Course Outcomes	Knowledge Level
CO1	Use conventional surveying tools such as chain/tape and compass for plotting and area determination.	K3 Apply
CO2	Apply levelling principles in field to determine reduced levels.	K3 Apply
CO3	Determine distances, heights and level differences using theodolite and tacheometric surveys.	K3 Apply
CO4	Compute height, distance and contouring using total station and demonstrate the use of modern surveying instruments.	K3 Apply

Mapping of course outcomes with program outcomes and program specific outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	-	2	1	-	-	2	-	-	-	2	1	-
CO2	2	2	-	2	1	-	-	2	-	-	-	1	1	-
CO3	2	3	-	2	1	-	-	2	-	-	-	2	1	-
CO4	1	2	-	2	2	-	-	2	-	-	-	1	1	-
Avg	2	2.25	-	2	1.25	-	-	2	-	-	-	1.5	1	-

Mapping of course outcomes with Knowledge and Attitude Profile (WK)

	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9
CO1	*	*	*	*		*		*	
CO2	*	*	*	*		*		*	
CO3	*	*	*	*		*		*	
CO4	*	*	*	*		*		*	

Wks Mapped with the course

WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9
*	*	*	*		*		*	

Mark Distribution:

Total Marks	CIE Marks	ESE Marks	ESE Duration
100	50	50	3hrs

Continuous Internal Evaluation Marks (CIE):

Attendance	Preparation/Pre-Lab Work experiments, Viva and Timely completion of Lab Reports / Record (Continuous Assessment)	Internal Examination	Total
5	25	20	50

1. Preparation and Pre-Lab Work (7 Marks)

- Pre-Lab Assignments: Assessment of pre-lab assignments or quizzes that test understanding of the upcoming experiment.
- Understanding of Theory: Evaluation based on students' preparation and understanding of the theoretical background related to the experiments.

2. Conduct of Experiments (7 Marks)

- Procedure and Execution: Adherence to correct procedures, accurate execution of experiments, and following safety protocols.
- Skill Proficiency: Proficiency in handling equipment, accuracy in observations, and trouble-shooting skills during the experiments.
- Teamwork: Collaboration and participation in group experiments.

3. Lab Reports and Record Keeping (6 Marks)

- Quality of Reports: Clarity, completeness and accuracy of lab reports. Proper documentation of experiments, data analysis and conclusions.
- Timely Submission: Adhering to deadlines for submitting lab reports/rough record and maintaining a

well-organized fair record.

4. Viva Voce (5 Marks)

- Oral Examination: Ability to explain the experiment, results and underlying principles during a viva voce session.

Final Marks Averaging: The final marks for preparation, conduct of experiments, viva, and record are the average of all the specified experiments in the syllabus.

End Semester Examination Marks (ESE):

Procedure/ Preparatory work/Design/ Algorithm	Conduct of experiment/ Execution of work/ troubleshooting	Result with valid inference/ Quality of Output	Viva voce	Record	Total
10	15	10	10	5	50

Submission of Record: Students shall be allowed to attend the end semester examination only upon submitting the duly certified record. The external examiner shall endorse the record

1. Procedure/Preliminary Work/Design/Algorithm (10 Marks)

- Procedure Understanding and Description: Clarity in explaining the procedure and understanding each step involved.
- Preliminary Work and Planning: Thoroughness in planning and organizing materials/equipment.
- Algorithm Development: Correctness and efficiency of the algorithm related to the experiment.
- Creativity and logic in algorithm or experimental design.

2. Conduct of Experiment/Execution of Work/Programming (15 Marks)

- Setup and Execution: Proper setup and accurate execution of the experiment or programming task.

3. Result with Valid Inference/Quality of Output (10 Marks)

- Accuracy of Results: Precision and correctness of the obtained results.
- Analysis and Interpretation: Validity of inferences drawn from the experiment or quality of program output.

4. Viva Voce (10 Marks)

- Ability to explain the experiment, procedure results and answer related questions
- Proficiency in answering questions related to theoretical and practical aspects of the subject.

5. Record (5 Marks)

- Completeness, clarity, and accuracy of the lab record submitted

SYLLABUS

Expt. No	List of Experiments
1	Introduction to Conventional Surveying a. Chain surveying b. Compass surveying
2	Levelling Simple leveling Differential levelling Fly levelling Profile levelling and cross sectioning
3	
4	
5	
6	Theodolite surveying Distance between accessible points Distance between inaccessible points Level difference between points Tangential tacheometry Height of building Traversing – Balancing the traverse using Bowditch rule, Transit rule and graphical method.
7	
8	
9	
10	
11	
12	Total station survey Remote height measurement Distance between two points Computation of area of a plot Contouring
13	
14	
15	
16	Land survey using DGPS
17	Study of instruments Automatic level , Digital level ,Handheld GPS

*** A minimum of 12 experiments is mandatory**

Text Books:

1. Dr. B.C. Punmia, Ashok Kumar Jain & Arun Kumar Jain (2005). Surveying. Laxmi publications (P) Ltd.
2. C. Venkatramaiah (2011). Textbook of Surveying. Universities Press (India) Private Limited.
3. Prof. T.P. Kenetkar & Prof. S.V. Kulkarni (2004). Surveying and Levelling. Pune Vidyarthi Griha Prakashan.

Reference Books:

1. R. Agor (2005). A Text book of Surveying and Levelling. Khanna Publishers.
2. S.K. Duggal (2015). Surveying Vol. I. Reprint. Tata McGraw Hill Ltd.
3. S.K. Duggal (2015). Surveying Vol. II, Reprint. Tata McGraw Hill Ltd.