



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

ADVANCED SURVEYING LABORATORY

VI Semester: CE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
ACED39	Core	L	T	P	C	CIA	SEE	Total
		0	0	2	1	40	60	100
Contact Classes: 45	Total Tutorials: 0	Total Practical Classes: 45				Total Classes: 45		
Prerequisite: Strength of materials, Structural Analysis								

I. COURSE OVERVIEW:

Advanced Surveying is intended to enhance the learning experience of the student in topics encountered in Surveying and Geomatics. Surveying refers to tracing points on ground or field. This course gives an overview on surveying with respect to tracing of points locating inaccessible distances, tracing curve and path, contours etc., This course also focuses on advanced surveying techniques, including EDM, photogrammetry and Remote sensing. Further the course is useful to solve the complex problems related to measuring inaccessible distances, remote elevation and distances by collecting and evaluating data such as horizontal distances, vertical distances, slopes and elevations.

II. COURSE OBJECTIVES:

The student will try to learn:

- The concept of surveys and technology involved in measuring field parameters using traditional and modern instruments.
- Operating principles of various levelling instruments and analyze their performance characteristics under various terrains.
- Measurement of alteration works, detecting land use and land cover, creating base maps for visual reference.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

- CO1 Explain the concept of traversing in theodolite for measuring horizontal and vertical angles.
- CO2 Demonstrate trigonometric leveling for locating inaccessible heights and distances.
- CO3 Identify the suitable repetition and reiteration methods in theodolite survey for tracing out the centering point on ground.
- CO4 Examine the reduced levels using leveling apparatus for illustrating longitudinal section and cross section and plotting.
- CO5 Examine contours for investigating the suitable path along the alignment at conflict points.
- CO6 Utilize the concept of remote elevation and remote distance in total station at various operating conditions and data record keeping.

IV. COURSE CONTENT:

Week- 1: CHAIN AND TAPE SURVEYING – DISTANCE MEASUREMENT & ERROR ANALYSIS

Batch I: Chain and Tape Surveying – Distance Measurement & Error Analysis

Batch II: Chain and Tape Surveying – Distance Measurement & Error Analysis

Week-2: STUDY OF THEODOLITE IN DETAIL-PRACTICE FOR MEASUREMENT OF HORIZONTAL AND VERTICAL ANGLES.

Batch I: Study of theodolite

Batch II: Study of theodolite

Week-3: MEASUREMENT OF HORIZONTAL ANGLES BY METHOD OF REPETITION AND REITERATION.

Batch I: Measurement of horizontal angles

Batch II: Measurement of horizontal angles

Week-4: TRIGONOMETRIC LEVELING- HEIGHTS AND DISTANCE PROBLEMS

Batch I: Trigonometric leveling- heights and distance problems

Batch II: Trigonometric leveling- heights and distance problems

Week-5: CURVE SETTING –DIFFERENT METHODS

Batch I: Curve setting: different methods.

Batch II: Curve setting: different methods.

Week 6: HEIGHTS AND DISTANCES USING PRINCIPLES OF TACHEOMETRIC SURVEY

Batch I: Heights and distances using principles of tacheometric survey.

Batch II: Heights and distances using principles of tacheometric survey.

Week-7: SETTING OUT WORKS FOR BUILDINGS AND PIPE LINES

Batch I: Setting out works for buildings and pipe lines.

Batch II: Setting out works for buildings and pipe lines.

Week-8: STUDY OF TOTAL STATION IN DETAIL-PRACTICE FOR MEASUREMENT OF HORIZONTAL AND VERTICAL ANGLES.

Batch I: Detail study of total station and practicing of horizontal and vertical angles.

Batch II: Detail study of total station and practicing of horizontal and vertical angles.

Week-9: DETERMINATION OF AN AREA USING TOTAL STATION

Batch I: Determination of an area using total station.

Batch II: Determination of an area using total station.

Week-10: TRAVERSING USING TOTAL STATION

Batch I: Determination of an area using total station.

Batch II: Determination of an area using total station.

Week-11: CONTOURING USING TOTAL STATION

Batch I: Contouring using total station.

Batch II: Contouring using total station.

Week-12: DETERMINATION OF REMOTE HEIGHT USING TOTAL STATION

Batch I: Determination of remote height using total station.

Batch II: Determination of remote height using total station.

Week-13: STATE-OUT USING TOTAL STATION

Batch I: State-out using total station.

Batch II: State-out using total station.

Week-14: CALCULATION OF DISTANCE, GRADIENT AND DIFFERENT HEIGHTS BETWEEN TWO INACCESSIBLE POINTS USING TOTAL STATION.

Batch I: Calculating distance, gradient and different heights between two inaccessible points using total station.

Batch II: Calculating distance, gradient and different heights between two inaccessible points using total station.

V. TEXT BOOKS:

1. Anderson, James M. Mikhail, "Surveying: Theory and Practice", Tata McGraw Hill Education, 2012.
2. S. S. Bhavikatti, "Surveying Theory and Practice", IK Books, New Delhi, 2010.
3. H. S. Moondra, Rajiv Gupta, "Laboratory Manual for Civil Engineering", CBS Publishers Pvt Ltd., New Delhi, 2nd Edition, 2013

VI. REFERENCE BOOKS:

1. P Venugopala Rao, Vijayalakshmi Akella, "Textbook on Surveying", PHI Learning, New Delhi, 1st Edition, 2015.

VII. ELECTRONICS RESOURCES:

1. [https://www.iare.ac.in/sites/default/files/lab1/IARE Advanced Surveying laboratory.pdf](https://www.iare.ac.in/sites/default/files/lab1/IARE%20Advanced%20Surveying%20laboratory.pdf)
2. <https://www.dbit.ac.in/ce/syllabus/advanced-surveying-lab.pdf>
3. <https://edudravida.in/22301-2/>
4. <https://www.docdroid.net/nrxmNRY/advanced-surveying-lab-manual-docx>

VIII. MATERIALS ONLINE:

1. Course Template
2. Laboratory manual