Surveying

01CI1303

Objective of the Course:

- To know different field method of surveying.
- To calculate internal angles of the traverse.
- To calculate latitude and departure of traverse lines.
- To study types of curves and their field setting out.
- To understand method to calculate area and volume.
- To apply concept of area and volume to field applications like quantity of cutting & filling or capacity of reservoir.

Credit Earned: 03

Students learning outcomes:

After successful completion of the course, it is expected that student will be able to,

1. Understand basic principles of various methods of surveying.
2. Obtain the included angles, latitude and departure of the traverse lines on the field.
3. Set the different types of curves on the field during survey work
4. Analyze, calculate and measure the area and volumes of the different capacities and topographical situations

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA (M)	CSE (I)	Viva (V)	Term Work (TW)	
02	00	02	03	50	30	20	25	25	150

Detailed Syllabus

Sr No.	Title of the unit	Number of hours
1	**Plane Table Survey**	**04**
	Introduction, principle, instruments, setting up the plane table, methods of plane tabling, advantages of plane table survey	

2	**Theodolite Traversing**	08
	Introduction, Fundamental definitions, Theodolite and its functioning, Measurement of vertical and horizontal angles, Methods of traversing, closing error, Calculation of latitudes and departure, checks and balancing of traverse, Gale's traverse table, Omitted measurements.	
3	**Trigonometric leveling**	03
	Method of indirect leveling, Methods of leveling on steep ground.	
4	**Tacheometry**	03
	Definitions, Principle of tacheometry, Self-reducing tacheometers and methods	
5	**Curves**	04
	Introduction, Basics and geometry, Issues in curve location, Elements and setting out of circular and transit curves, Elements of vertical curves.	
6	**Field Area & Volumes**	06
	Calculation of areas having regular & irregular boundaries, Trapezoidal formula, Simpson's rule, Digital planimeter, computation of volume for Earthwork volume calculation for cutting & filling, Volume from cross sections Calculation of reservoir capacity.	
	Total	**28**

List of Practicals

1. Traversing by the Theodolite and traverse plotting by applying corrections in Gale's traverse table.
2. Setting out the simple circular curve using various methods.
3. Setting out the combined curve including (a) Transition (b) Circular (c) Transition.
4. Setting out the foundation for simple building.
5. Computation of area of submergence and storage volume from contour maps for reservoir projects.

Suggested Theory Distribution

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve an effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	20%	40%	15%	10%	5%

Instructional Method and Pedagogy:

1. At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
2. Lectures will be taken in class room with the use of multi-media presentations, black board – mix of both.
3. Attendance is compulsory in lectures and laboratory which carries a 5% component of the overall evaluation.
4. Minimum two internal exams will be conducted and average of two will be considered as a part of 15% overall evaluation
5. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. It carries a weightage of 5%.
6. Surprise tests/Quizzes will be conducted which carries 5% component of the overall evaluation.

Recommended Study Material

Text Books

1. Dr. B.C. Punamia, Surveying Vol.I, II and III, Laxmi Publication
2. S. K. Duggal, Surveying Vol. I and II, Tata McGraw-Hill Education

Reference Books

1. Dr. K.R. Arora, Surveying Vol. I, II and III, Standard Book House, New Delhi
2. N.N. Basak, Surveying and Levelling, Tata McGraw-Hill Education
3. R. Agor, Surveying and Levelling, Khanna Publishers, New Delhi
4. R. Agor, Advanced Surveying, Khanna Publishers, New Delhi
5. Subramanian, R., Surveying and Leveling, Oxford University Press, New Delhi

List of Open-Source Software/learning website:

- https://nptel.ac.in/courses/105/107/105107122