

GUJARAT TECHNOLOGICAL UNIVERSITY

CIVIL ENGINEERING (06) / MINING (22)

SURVEYING

SUBJECT CODE: 2130601

B.E. 3rd Semester

Type of course: Engineering and Technology

Prerequisite: Student shall have studied basic Elements of Civil Engineering

Rationale: To develop concepts of various types of land surveying and prepare and interpret maps and drawing.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks			Practical Marks			
			ESE (E)	PA (M)		PA (V)		PA (I)		
PA	ALA	ESE		OEP						
3	0	2	5	70	20	10	20	10	20	150

Contents:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
Module 1			
1	Plane Table Survey: Introduction, principle, instruments, setting up the plane table, methods of plane tabling, advantages, sources of Errors.	10	20
2	Theodolite Traversing: Introduction, definitions, the vernier transit theodolite, temporary and permanent adjustment of theodolite, measuring horizontal and vertical angles, methods of traversing, closing error, computation of latitudes and departure, check in closed and open traverse, balancing of traverse, Gale's table, traverse area, omitted measurements	10	20
3	Trigonometric levelling: Indirect levelling, levelling on steep ground- methods.	6	15
Module 2			
4	Curves: Introduction, theory and setting out methods of simple circular curve, elements of a compound and reverse curves, transition curve, types of transition curve, combined curve, types of vertical curves.	6	15
Module 3			
5	Computation of Areas: Methods to compute area of traverse- Determining areas from Plans, Trapezoidal rule- Simpson's rule, Use of planimeter Computation of Volumes- Volume from cross sections, Trapezoidal and Prismoidal formulae, Prismoidal correction, Curvature correction, Determination of capacity of reservoir and volume from borrow pits.	6	15
Module 4			

6	Hydrography: Introduction, purposes, control points, soundings, instruments & methods of locating soundings.	2	5
7	Setting out Works: Building, Culvert, Bridge, Tunnel	2	5

Reference Books:

1. Surveying Vol.I, II and III by Dr. B.C. Punamia
2. Surveying and Levelling Vol. I and II by T.P Kanetkar and S.V Kulkarni
3. Surveying Vol. I, II and III by Dr. K.R. Arora
4. Surveying Vol. I and II by S. K. Duggal
5. Surveying and Levelling by N.N. Basak
6. Surveying and Levelling by R. Agor
7. Advanced Surveying by R. Agor.
8. Roy, S.K., Fundamentals of Surveying, Prentice Hall India, New Delhi
9. Subramanian, R., Surveying and Leveling, Oxford University Press, New Delhi

Course Outcome:

- Conduct plane table and theodolite traverse surveys at identified Site.
- Conduct trigonometrically leveling
- Set out simple circular and transition curves at given location
- Compute areas and volumes using standard rules and equipment's such as planimeter
- Conduct hydrographical survey
- Give layout of foundations for buildings, culverts, bridges and tunnels as per plan/drawing.

List of Experiments:

- Plane table traversing by intersection and radiation methods
- Two point problem and three point problem
- Theodolite traversing and plotting of traverse by applying corrections in Gale's traverse table
- Setting out simple circular curve by different methods
- Setting out combined curve (Transition - Circular – Transition)
- Setting out building foundations
- Computation of area of submergence and storage volume from contour maps for reservoir projects.

Design based Problems/Open Ended Problems:

1. To find the capacity of reservoir
2. Identify location of recharge well for various sites

Term Work:

Term work shall be based on the following field projects conducted by students:

- 1) Plane table survey project.
- 2) Theodolite traverse survey project.
- 3) Setting out of curve.

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.