

# GUJARAT TECHNOLOGICAL UNIVERSITY

## CIVIL AND INFRASTRUCTURE ENGINEERING GEOMATICS ENGINEERING

**SUBJECT CODE: 2134003**

**B.E. 3<sup>rd</sup> Semester**

**Type of course:** Core Subject in Civil and infrastructure engineering

**Prerequisite:** No Prerequisite

**Teaching and Examination Scheme:**

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P		Theory Marks			Practical Marks			
			ESE	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	Hours	% Weightage
1	Electronics Theodolite survey: 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. Introduction to surveying.	6	14
2	Tachometric Surveying : Introduction, purpose, principle, instruments, stadia constants, methods of tachometry, anallatic lens, subtense bar, field work in tachometry, reduction of readings, errors and precisions.	6	14
3	Trigonometric levelling: Indirect levelling, levelling on steep ground methods.	6	14
4	Geodetic Surveying- Principle and Classification of triangulation system- Selection of base line and stations- Orders of triangulation- Triangulation figures- Station marks and signals- marking signals- Extension of base, Reduction of Centre, Selection and marking of stations	6	14
5	Total Station Surveying: Introduction, Electromagnetic distance measurement principles, horizontal & vertical angle measurements, setting up the total station, various field applications of total station surveying, data transfer mechanism and further process, advantages.	10	24
6	Modern Surveying Instruments: Introduction, Electromagnetic distance measurement, Total station, Drone Survey (visual, LIDAR, multispectral & Thermal), DGPS survey, hydrographic survey.	12	14
7	Setting Out Works: Building, Culvert, Bridge, Tunnel	02	05

**Reference Books:**

- T. P. Kanetkar and S. V. Kulkarni, Surveying and Levelling, Vol-I and Vol-II, Pune Vidyarthi Griha Prakshan, 1972.
- B. C. Punmia, A.K. Jain & A.K. Jain, Surveying, Vol-I and Vol-II, Laxmi Publication Pvt., 1996.
- T.M. Lillesand and R.W. Kiefer, Remote Sensing and Image Interpretation, John Wiley & Sons, 1994.
- G. W. Schofield, Engineering Surveying, Butterworth, Heinemann, New Delhi, 2001.
- G. Joseph, Fundamentals of Remote Sensing, Universities Press, 2003.
- Dr. K.R. Arora, Surveying Vol. I, II and III, Standard Book House. New Delhi
- S. K. Duggal, Surveying Vol. I and II, Tata Mcgraw Hill, New Delhi
- R. Agor, Surveying and Levelling, Khanna Publishers, New Delhi
- R. Agor, Advanced Surveying, Khanna Publishers, New Delhi