SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Bachelor of Technology
Civil Engineering

B. Tech. II Year Semester – III

Subject Name: Surveying **Subject Code:** BTCL13304

Type of course: PCC III
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				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	150
2	0	2	3	60	25	15	30	20	

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1.	**Introduction to Surveying:** Definition of surveying, Objects of Surveying, Fundamentals principles of surveying, Classification of surveying, Application of surveying, Plan and Map, Linear Measurements, Angular Measurements, Leveling and Modern tools.	7	25%
2.	**Plane Table Survey:** Introduction, principle, instruments, setting up the plane table, methods of plane tabling, advantages, sources of Errors.	4	10%
3.	**Theodolite Traversing** Introduction, types of theodolite, concept and application, terms and definitions, 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.	7	25%
4.	**Curves** Introduction, classification of curves, Elements of a simple circular, designation of curve, methods of setting out a simple circular curve, elements of a compound and reverse curves, transition curve, types of transition curves, combined curve, types of vertical curves.	7	25%
5.	**Areas and Volumes** Introduction, computation of area, computation of area from field notes and plotted plans, boundary area, area of traverse, Use of	5	15%

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	Plannimeter, computations of volumes, Volume from cross sections, Trapezoidal and Prismoidal formula, Prismoidal correction, Curvature correction, capacity of reservoir, volume from borrow pits.		

Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
10%	10%	50%	10%	10%	10%

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels **(Revised Bloom's Taxonomy)**

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	Surveying and levelling	N. N. Basak	Tata Mcgraw Hill, New Delhi (ISBN: 978-0074603994)	Oct 1, 1994	1st
2	Surveying	Dr. K.R.Arora	Standard Book House, New Delhi (ISBN – 9788189401238)	2019	17th
3	Surveying,	B.C.Punmia, Ashok Kumar Jain, Arun Kumar Jain	Laxmi Publications, New Delhi (ISBN: 978-8170088530)	2016	17th
4	Surveying and Levelling,	T.P. Kanetkar and S.V Kulkarni	Pune Vidyarthi Griha Prakhashan, Pune (ISBN: 9788185825007, 9788185825007)	2010	24th
5	Surveying	S. K. Duggal	Tata Mcgraw Hill, New Delhi (ISBN: 9780070534704, 0070534705)	2009	3rd
6	Surveying and Levelling	R. Agor	Khanna Publishers, New Delhi (ISBN: 978-81-7409-235-9)	1980	12th

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Course Outcome:

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % weightage
CO-1	Students can be able to understand all the basics about surveying. *(R,U - Cognitive Level)*	20
CO-2	Students can able to understand and Conduct Plane table survey. *(U,A - Cognitive Level)*	20
CO-3	Students can able to understand and conduct different applications of theodolite. *(U,A,E- Cognitive Level)*	30
CO-4	Set out a simple and transition curve at a given location. *(U,A,N,C - Cognitive Level)*	20
CO - 5	Compute area and volume using standard rules and equipment such as Plannimeter. *(A,N,E,C - Cognitive Level)*	10

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO-1	1	1	1	-	-	-	-	3	3	1	1	3	1	-	3
CO-2	1	1	-	-	-	-	-	3	3	2	1	3	2	1	3
CO-3	2	1	-	2	-	1	-	3	3	2	2	3	2	2	3
CO-4	2	1	-	2	-	1	-	3	3	2	2	3	2	2	3
CO-5	2	1	-	1	-	-	-	3	2	1	1	3	1	-	3
Rationale *	8	5	1	5	-	2	-	5	14	8	7	15	8	5	15

Rationale*:
Most of the COs are satisfying the well-defined POs and PSOs upto certain extent. The principle of the surveying will help to develop concepts of various types of land surveying and prepare and interpret maps and drawing.

LIST OF PRACTICALS:

1. Linear and angular measurements (Chain and Compass)
2. Measuring the relative heights or elevations of the point on Plane or surface using Dumpy level
3. Plane table traversing by intersection and radiation methods
4. Theodolite traversing and plotting of traverse by applying corrections in Gale's traverse table
5. Setting out simple circular curve by different methods
6. Setting out combined curve (Transition - Circular – Transition).
7. Computation of area of submergence and storage volume from contour maps for reservoir projects.

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Major Equipment:

1. Chain and Tape
2. Ranging rod
3. Offsets
4. Line ranger
5. Pegs
6. Arrows
7. Plumb bob
8. Prismatic and Surveyor Compass
9. Dumpy level
10. Plane table
11. Planimeter
12. Theodolite

List of Open learning website:

- http://nptel.ac.in/courses/105107122/
    - Basic Concepts of Surveying

List of Open Source Software:

1. MensorGIS
2. Surfer15