

# SURVEYING & MEASUREMENT

<b>Subject Code</b> <b>00205</b>	<b>Theory</b>			<b>No of Period in one session : 50</b>		
	<b>No. of Periods Per Week</b>			<b>Full Marks</b>	<b>:</b>	<b>100</b>
	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>Annual Exam.</b>	<b>:</b>	<b>80</b>
	<b>04</b>		<b>—</b>	<b>Internal Exam.</b>	<b>:</b>	<b>20</b>

**Rationale & Objective:**

Knowledge of surveying in respect of Land Survey and measurement is essential to all of the Engineering students. Any project can take off only after proper conduct of the desired survey work and preparation of the necessary map using the physical data. For these the knowledge of Land Survey is essential. The students must also develop the skill to measure by proper use of Survey instruction through the knowledge of surveying so that the technicians can fix the slope of floor. Conveyors, waste & water pipe-lines and fix the height of machines & chimneys. The following topics and contents will fulfill the objectives.

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>	<u>Tutorial</u>
1	General Introduction	(05)	1
2	Chain Surveying	(12)	2
3	Compass Surveying	(09)	2
4	Plane table Surveying	(06)	1
5	Levelling	(12)	3
6	Theodolite & Layout of Structure	(06)	1
		<b>(50)</b>	<b>10</b>

**CONTENTS:**

**TOPIC: 01 - GENERAL INTRODUCTION:**

01 Definition, Classification, Principle of Surveying. Vernier scales, GPS & GIS, Fundamental and its application. [05]

**TOPIC: 02 - CHAIN SURVEYING:**

02.01 Measurement of distance, different types of chain & tapes, testing of chain & its adjustment. Instruments used in chain survey, Ranging, Direct & Indirect Ranging, line ranger, error in length due to incorrect chain, chaining of sloping ground, error in chaining, Tape corrections. [12]

02.02 Chain Surveying, principle of chain surveying, surveying stations, base line, check line, tie line offsets, oblique offsets, booking field notes, field works. Instruments for setting-out right angles staffs and optical square, right angle with chain & tape, obstacles in chaining, cross staff survey plotting of chain survey.

**TOPIC: 03 - COMPASS SURVEYING**

03.01 Purpose, use & comparison with chain surveying traversing. [09]

03.02 Compass - prismatic & survey's compass, its description.

03.03 Bearing, meridians, type of bearing, Fore bearing & Back bearing, computation of included angles.

03.04 Local attraction causes, errors corrections, Dip, Declination.

03.05 Traversing with chain & compass, plotting of traverse survey. Closing error and its adjustment.

**TOPIC: 04 - PLANE TABLE SURVEYING**

04.01 Object & comparison with chain & compass surveying instruments used in plane table surveying. [06]

04.02 Setting up of plane table, centering, orientation & levelling.

04.03 Method of plane table surveying - (i) Radiation (ii) Intersection (iii) Traversing (iv) Resection.

04.04 Statement of two points & three points problem and their solution.

04.05 Errors in plane tabling & their elimination.

**TOPIC: 05 - LEVELLING**

05.01 Definition of terms used in levelling, instruments used in levelling and their description. [12]

05.02 Adjustment of the level, temporary adjustments. Bench marks, different types of B.M., change points, steps in levelling, Principle of levelling, reduction of levels, H.I. method, rise & fall method, booking of staff reading, examples on levelling.

05.03 Classification of levelling, fly levelling, longitudinal & cross-sectional levelling.

05.04 Curvature & refraction.

05.05 Elementary knowledge of contours, use & characteristic of contour lines.

**TOPIC: 06 - THEODOLITE & LAYOUT OF STRUCTURES**

06.01 Introduction, different parts of the theodolite. [06]

06.02 Temporary adjustments of the theodolite.

06.03 Measurements of horizontal and vertical angles.

06.04 Prolonging a line, bearing of a line. Ranging of a line.

**Books Recommended:**

1	Surveying & Levelling Part-I	- By T.P. Kanetkar & S.V. Kulkarni
2	Surveying Vol. I	- By B.C. Punamia
3	Surveying	- By Hussain & Nagraj
4	Surveying & Levelling	- By Agar
5	सर्वेक्षण	- जे. झा
6	सर्वेक्षण	- गुरुचरण सिंह
7	Plane & Geodetic Surveying Vol. I	- By David Clark