

<b>Devi Ahilya Vishwavidhyalaya, Indore, India Institute of Engineering &amp; Technology</b>				<b>II Year B.Tech. (Civil Engineering)</b>		
<b>Course Code &amp; Name</b>	<b>Instructions Hours per Semester and Credits</b>					
<b>3RVPC2  Surveying</b>	<b>Classroom Instruction (CI)</b>		<b>Lab Instruction (LI)</b>	<b>Term Work (TW) and Self Learning (SL)</b>	<b>Total no. of Hours Per semester</b>	<b>Total Credits (Total Hours/ 30)</b>
	<b>L</b>	<b>T</b>	<b>P</b>	<b>TW+SL</b>	<b>120</b>	<b>4</b>
	<b>20</b>	<b>10</b>	<b>20</b>	<b>70</b>		

**Course Learning Objectives:**

1. To study the various equipment used in surveying.
2. To know about the methods of measuring angles, distances, and elevations.
3. To know about the working principles of survey instruments
4. To Estimate measurement errors and apply corrections
5. To Interpret survey data and computing areas and volumes

**Prerequisites: Geometry, mensuration**

**COURSE CONTENTS**

**UNIT I:**

**Introduction to Surveying**

Overview of Surveying, branches of surveying, principles of Surveying. Instruments Used for various measurements, Electronic Distance Measurement (EDM), Various EDM Instruments, Remote Sensing, GPS and GIS

**Unit-II:**

**Angular measurements**

Overview and terminologies, Principle of Compass, Types of Compasses, Compass Surveying, Traversing, Traversing with Chain and Compass, Designation of Bearings, Calculation of Included Angle from Bearings, Calculation of Bearing from Included Angles Errors and Precautions in Compass Surveying, Local attraction, Correction to Measured Bearing for Local Attraction, Adjustment of Closing Error. Magnetic Declination, Dip, Introduction Plane Table Surveying, Methods of Plane Table Surveying- Radiation Method and Intersection Method. Introduction to Theodolite, Numerical Problems.

**Unit-III Vertical Measurements**

Overview and terminologies, Leveling Instruments-Different Types of Levels, Leveling Staff. Temporary and Permanent Adjustments of a Level. Leveling: Classification Based on Purpose of Leveling –Simple leveling, Differential or Compound or Continuous Leveling, Booking and Reducing Levels. Height of Collimation or Height of Instruments Method. Rise and Fall Method, Errors and Precautions in Leveling, Balancing Back Sight and Foresight, Error Due to Earth’s Curvature and Refraction, Field Problems or Difficulties in Leveling, Numerical Problems.

**Unit –IV Measurement of Area**

Measurement of Areas and Volumes: Introduction, Areas: Areas from Field Measurements, Area Consisting of Irregular Boundary, Area from Plan –Graphical Method, Measurement of Area by Planimeter Errors & Precautions in Computation of Area.

**Unit–V Contours**

Characteristics, methods of contouring, Measurement of Volume: Measurement of Volume – from Cross Sections, from Spot Levels, from Contours, Area of Sections, Capacity of a Reservoir, Elevation - Capacity Curve, Earthwork, and Mass Diagram. Numerical Problems.

**Course Outcome:**

CO. No.	CO	PO
CO1	Understand the working principles of survey instruments	PO-1, PO-2, PO-5
CO2	Apply the techniques of measurement in field of survey	PO-1
CO3	Analyse the survey data for computation of area and volume	PO-2
CO4	Apply knowledge of contours to make and interpret maps	PO-1, PO-2, PO-3
CO5	Understand the procedure of data entry in field books and level books	PO-1, PO-2

**Books recommended:**

1. B.C Punmia , Surveying Vol-II & III ,Laxmi Publication.
2. S.K. Duggal, Surveying Vol. II McGraw Hill Publishing Company Ltd.
4. T.P. Kanetkar and S.V. Kulkarni Surveying and Leveling-Part-I & II , Pune Vidyarthi Griha Prakashan, Pune.
6. Remote Sensing and image interpretation by Lillesand T.M. and Kiefer R.W.
7. R.Agor, Advance Surveying ,Khanna Publisher
8. Chandra AM, Higher Surveying, New Age International, new Delhi

**CO-PO Relationship**

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO 1	PSO 2	PSO 3
3RVPC1.CO1	3	2			3							1		
3RVPC1.CO2	3												3	
3RVPC1.CO3	2	3	3									2	3	
3RVPC1.CO4	2	3	3	3								2	3	3
3RVPC1.CO5	2	3										2	3	

**List of Practical Assignment:**

1. Measurement of Distance by Chaining and Ranging.
2. Locating Various Objects by Chain or Cross-Staff Surveying.
3. Measurement of bearings of sides of traverse with prismatic compass and computation of correct included angle.
4. Determination of elevation of various points with dumpy level by collimation plane method and rise & fall method.
5. Fixing bench mark with respect to temporary bench mark with dumpy level by fly levelling

and check levelling.

6. Measurement of vertical angles with theodolite.

7. Determination of horizontal distance between two inaccessible points with theodolite.

8. Locating given building by theodolite traversing.