Program : **Diploma in Civil Engineering / Civil & Environmental Engineering / Civil & Rural Engineering / Environmental Engineering**	
Course Code : **2011**	Course Title: **Basic Surveying**
Semester : **2**	Credits: **3**
Course Category: **Engineering Science**	
Periods per week: **3 (L:3, T:0, P:0)**	Periods per semester: **45**

Course Objectives:

- To develop the concept of basic principles of surveying including the uses of chain and plane table survey.
- To demonstrate bearing, declination, dip, traversing etc
- To impart idea about levelling and sectioning of surfaces

Course Prerequisites:

Topic/Description	Course code	Course Title	Semester
Basic knowledge in mathematics		Engineering Mathematics	1

Course Outcomes:

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Compute area of land by using principles of chain and plane table survey	11	Applying
CO2	Determine bearings and angles by compass survey	12	Applying
CO3	Compute the level difference and gradient using principles of leveling	11	Applying
CO4	Plot longitudinal section and cross sections of surfaces	9	Applying
	Series test	2	

CO – PO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3						
CO2	3						
CO3	3						
CO4	3						

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline:

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Compute area of land by using principles of chain and plane table survey**		
M1.01	Outline the purpose and use of surveying	2	Understanding
M1.02	Describe different types of surveying and Principles of surveying	2	Understanding
M1.03	Identify solutions to overcome obstacles in chain survey.	4	Applying
M1.04	Describe different methods of plane tabling	3	Understanding
Contents: Concept of surveying - principles of surveying - purpose of surveying - Plane surveying and geodetic surveying. Classification of surveys - based on instruments, based on nature of field - reconnaissance survey. Units of measurements - linear and angular measurements Chain Surveying - equipment used. Different types of chain and tape-selection of stations - base line - check line - tie line. Ranging - different methods-, Chaining and taking offsets, setting out right angles. Calculate the area of the plot by cross staff survey and triangulation. (simple problems) Obstacles in chaining - methods to overcome obstacles, conventional signs. Plane table survey - Purpose, accessories of plane table - description and use - setting up the plane table - radiation, intersection, traversing, and resection.			
CO2	**Determine bearings and angles by compass survey**		
M2.01	Explain technical terms used in compass survey	2	Understanding
M2.02	Apply methods of correction of observed bearings	3	Applying
M2.03	Illustrate plotting of traverse by different methods	3	Understanding
M2.04	Describe different methods of adjustment of traverse	4	Understanding
	Series Test I	1	

Contents:

Purpose and principles of compass survey - types of compass-description and working of prismatic compass - concept of meridian - bearing of a line - True bearing and magnetic bearing. Magnetic dip and declination. Field work in compass survey - booking of field notes. Reduced and whole circle bearings. Calculations of included angles in compass traverse. Sources of errors in compass surveying - local attraction - detection and Correction. Plotting of compass traverse - closing error and adjustments.

CO3	**Compute the level difference and gradient using principles of leveling**		
M3.01	Explain terminology used in leveling	2	Understanding
M3.02	Describe different instruments used in leveling	3	Remembering
M3.03	Compute reduced levels by different methods.	6	Applying

Contents:

Purpose of levelling - concept of level surface, datum, reduced level and Bench mark. Types of leveling instruments - dumpy, Wye, modern tilting and automatic levels. Component parts of leveling instrument - concept of line of collimation, axis of bubble tube, axis of telescope, Types of levelling staff. Field work - Temporary adjustments, form of level book. Reduction of levels by rise and fall method and height of collimation method - comparison - problems.

CO4	**Plot longitudinal section and cross sections of surfaces**		
M4.01	Identify different types of leveling	3	Understanding
M4.02	Plot longitudinal sections and cross sections	4	Applying
M4.03	Describe permanent adjustments of dumpy level.	2	Understanding
	Series Test II	1	

Contents:

Fly levelling, profile levelling, check levelling, reciprocal leveling. Longitudinal sectioning and cross sectioning - plotting - working profile for roads. Permanent adjustments of dumpy level.

Text / Reference:

T/R	Book Title/Author
T1	Punmia, B.C,; Jain, Ashok Kumar; Jain, Arun Kumar, Surveying I, Laxmi Publications, New Delhi.
R2	Arora K R, Surveying Vol. I, Standard Book House.
R3	Basak, N. N., Surveying and Levelling, McGraw Hill Education, New Delhi.
R4	Duggal, S. K., Survey I, McGraw Hill Education, New Delhi.
R5	Subramanian, R., Fundamentals of Surveying and Levelling, Oxford University Press. New Delhi.

Online resources:

Sl. No	Website Link
1	http://nptel.ac.in/courses
2	http://www.vlab.co.in/ba-nptel-labs-civil-engineering