Program : **Diploma in Civil Engineering / Civil & Environmental Engineering / Civil & Rural Engineering / Environmental Engineering**	
Course Code : **2019**	Course Title: **Basic Surveying Lab**
Semester : **2**	Credits: **Nil**
Course Category: **Engineering Science**	
Periods per week: **3 (L:0, T:0, P:3)**	Periods per semester: **45**

Course Objectives:

- To train students to use basic survey equipments like chain, cross staff, compass, levelling equipment.
- Enable them to plot ground features using plane table and measure bearings and obtain angles using compass for plotting traverses.
- Give hands on practice of levelling and sectioning of surfaces

Course Prerequisites:

Topic	Course code	Course name	Semester
Basic knowledge on area of different shapes, trigonometry.		Engineering Mathematics	1

Course Outcomes:

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

COn	Description	Duration (Hours)	Cognitive Level
CO1	Plot land area using principles of chain survey and plane table survey	10	Applying
CO2	Plot land area by compass survey	12	Applying
CO3	Determine level difference between stations in the field	9	Applying
CO4	Sketch longitudinal and cross profiles.	10	Applying
	Lab Tests	4	

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:

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

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Plot land area using principles of chain survey and plane table survey**		
M1.01	Use tape to measure distance between two survey stations when the two stations are intervisible.	1	Applying
M1.02	Determine area of open field using Tape and cross staff survey.	3	Applying
M1.03	Plot area by Radiation Method and intersection method of plane tabling	6	Applying
CO2	**Plot land area by compass survey**		
M2.01	Plot area by radiation method using tape and compass.	3	Applying
M2.02	Determine inaccessible distances between points using compass and tape.	6	Applying
M2.03	Plot area using tape and compass for a closed traverse of minimum 5 sides.	3	Applying
	Lab Test I	2	
CO3	**Determine level difference between stations in the field**		
M3.01	Determine level difference by simple leveling	3	Applying
M3.02	Determine reduced levels by Rise and Fall method and Height of Instrument (HI) method.	6	Applying

CO4	**Sketch longitudinal and cross profiles**.		
M4.01	Perform fly leveling with double check using dumpy level/ Auto level and levelling staff.	4	Applying
M4.02	Plot longitudinal profiles and cross sections for the alignment of road.	6	Applying
	Lab test-II	2	

Text / Reference:

T/R	Book Title/Author
T1	Punmia, B.C,; Jain, Ashok Kumar; Jain, Arun Kumar, Surveying I, Laxmi Publications., New Delhi
R2	Basak, N. N., Surveying and Levelling, McGraw Hill Education, New Delhi
R3	Kanetkar, T. P.; Kulkarni, S. V., Surveying and Levelling volume I, Pune Vidyarthi Gruh Prakashan
R4	Duggal, S. K., Survey I, McGraw Hill Education, New Delhi.
R5	Saikia, M D.; Das. B.M.; Das. M.M., Surveying, PHI Learning, New Delhi
R6	Subramanian, R., Fundamentals of Surveying and Levelling, Oxford University Press. New Delhi
R7	Bhavikatti, S. S., Surveying and Levelling, Volume 1, I. K. International, New Delhi.
R8	Rao, P. Venugopala Akella, Vijayalakshmi, Textbook of Surveying, PHI Learning
R9	Arora K R, Surveying Vol. I, Standard Book House

Online Resources:

Sl.No	Website Link
1	http://www.vlab.co.in/ba-nptel-labs-civil-engineering
2	https://nptel.ac.in/courses/105107122/