Program : **Diploma in Civil Engineering**	
Course Code : **4016**	Course Title: **Advanced Surveying Lab**
Semester : **4**	Credits: **1.5**
Course Category: **Program Core**	
Periods per week: **3 (L:0, T:0, P:3)**	Periods per semester: **45**

Course Objectives:

- To impart training to the students to apply tacheometry to find heights and distances.
- To develop skills in using Total Station & advanced surveying instruments.

Course Prerequisites:

Topic	Course code	Course name	Semester
Knowledge of Basic Mathematics		Engineering Mathematics	1 & 2
Measurement of angles and traversing		Surveying Lab	3

Course Outcomes:

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

COn	Description	Duration (Hours)	Cognitive level
CO1	Determine heights and distances by tacheometry	15	Applying
CO2	Set out circular curve on field	4	Applying
CO3	Apply Total station in field survey works.	19	Applying
CO4	Apply GPS survey in field works .	3	Applying
	Lab tests	4	

CO-PO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1		3		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	**Determine heights and distances by tacheometry**		
M1.01	Determine the values of stadia constants of the given instrument.	3	Applying
M1.02	Determine the horizontal distance and elevation of objects by stadia tacheometry.	3	Applying
M1.03	Determine the distance and elevation of various objects by tangential tacheometry.	3	Applying
M1.04	Determine the gradient of line joining two points by stadia and tangential methods.	6	Applying
CO2	**Set out circular curve on field**		
M2.01	Set out simple circular curve	4	Applying
	Lab Test I	2	
CO3	**Apply Total station in field survey works.**		
M3.01	Perform the temporary setting of total station	3	Applying
M3.02	Prepare site plan by traversing with total station	4	Applying
M3.03	Determine gradient, difference in height, distance etc between inaccessible points using total station	6	Applying
M3.04	Plot Contour plans using total station	6	Applying

CO4	Apply GPS survey in field works		
M4.01	Utilize GPS to find out coordinates (longitude and latitude) of a station	3	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 VidyarthiGruhPrakashan
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	De,Alak, Plane Surveying, S.Chand Publications, New Delhi.
R8	Rao, P. VenugopalaAkella, Vijayalakshmi, Textbook of Surveying, PHI Learning
R9	Venkatramaiah, C, Textbook of Surveying, Universities Press, Hyderabad.
R10	Anderson, James M and Mikhail, Edward M, Surveying theory and practice, McGraw Hill Education, Noida.

Online Resources:

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