Course Syllabus
Gyanmanjari Institute of Technology
Semester-4 (Diploma)

Subject: Surveying-II - DETCV14207

Type of course: Major core

Prerequisite: Surveying-I

Rationale:

Before the development and planning process for any civil engineering, first field survey of that area is carried out and various types of survey maps are prepared. These maps and drawings are used for taking various decisions regarding the planning, designing, estimation, execution, and construction process etc.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
				Theory Marks		Practical Marks		CA	
CI	T	P	C	ESE	MSE	V	P	ALA	
3	0	2	4	60	30	20	10	30	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Course Content:

Sr. No	Course Content	Hrs.	% Weightage
1	**Curves** Introduction, types, notations, relation between radius and degree, elements of simple circular curve, setting out of curve, methods. Transition curves, vertical curves, related examples	10	20%

2	**Tacheometric surveying** Purpose and principles, analytic lens, advantages and disadvantages of it. Method of determination of constant of a tacheometer. Related examples of it.	10	25%
3	**Total station** Total station: Introduction, principles of EDM, basics of total station: parts, types, advantages and disadvantages, surveying using total station, precaution, setup of theodolite, initial setting, field book reading, total station traversing, survey station description, maintenance, total survey system error sources and how to avoid them.	10	20%
4	**Global Positioning System** Introduction, maps and types of digital map, fundamental and uses of GPS, GPS receivers, Field procedure of GPS, observation and application in civil engineering.	05	15%
5	**Advanced surveying techniques:** Introduction and use of modern surveying equipments such as Differential Global Positioning System (DGPS), Unmanned Aerial Vehicle (UAV), Field procedures of modern surveying equipments, Data Retrieval, Understanding GIS and its components, Applications of GIS.	10	20%

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	**Calculations based on horizontal and vertical distance of given objects:** Students will calculate numericals assigned by faculty, based on horizontal and vertical distance of given objects. And will upload it on GMIU Web Portal.	10
2	**Calculations based on setting out of simple circular curve:** Students will calculate numericals assigned by faculty, based on setting out a simple circular curve using linear and angular methods. And will upload it on GMIU Web Portal.	10
3	**Prepare a project report:** Students will prepare a project report on the field procedure of GPS. And will upload it on GMIU Web Portal.	10
	Total	30

Suggested Specification table with Marks (Theory):60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage %	20%	25%	25%	20%	10%	-

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table

Course Outcome:

After learning the course, the students should be able to:	
CO1	Carry out a contour survey for undulating/hilly regions using a Tacheometer and prepare contour map.
CO2	Setting out a horizontal curve using a theodolite.
CO3	Carry out traverse survey using total station, import the data in the computer, and prepare drawing using Autocad.
CO4	Record and retrieve the data using a Hand-Held GPS
CO5	Retrieve the data and generate the drawings using advanced surveying equipment & application software.

List of Practical

Sr. No	Descriptions	Unit No	Hrs
1	Determine the elements of a simple circular curve. Computation of the data for setting out the curve by an offset of long Chord method	1	02
2	Computation of the data for setting out the curve By Rankine (one theodolite) method	1	02
3	Carry out the project for setting out a simple horizontal curve by Rankine's methods	1	02
4	Determine the constants of a tacheometer. Determine the distance and R.L. of a point when a line of sight is horizontal.	2	02
5	Determine the distance and R.L. of a point when a line of sight is inclined for an angle of elevation also in depression	2	02

6	Carry out the Tacheometry project for 4 to 5 stations for a closed traverse on undulating/hills regions and prepare the drawing sheet	2	04
7	Identify the parts of the Total Station, Set out the total station on a given station.	3	04
8	Set out the station by setting up a backsight, Measure the horizontal, vertical and deflection Angle by total station.	3	02
9	Store and download the data from a total station in the computer and convert the same into Auto CAD file.	3	02
10	Total Station survey Carry out the project for a small traverse with 4-5 stations on the ground and prepare the drawing with the required scale.	3	04
11	An overview of Hand-held GPS device, Record and retrieve the data using a Hand-Held GPS	3	02
12	Demonstration of Recording and Retrieving data collected from Modern Surveying techniques such as DGPS, UAV etc.	4	02

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory.

The internal evaluation will be done on the basis of Active Learning Assignment.

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

[1] Surveying and levelling Vol-I, T. P. Kanetkar & S. V. Kulkarni, Puna Vidyarthi Griha
[2] Surveying and Levelling Vol-II, T. P. Kanetkar & S. V. Kulkarni, Puna Vidyarthi Griha
[3] Surveying and Levelling Vol-I, Dr. B. C. Punmia, Laxmi Publications Pvt. Ltd.
[4] Surveying and Levelling Vol-II, Dr. B. C. Punmia, Laxmi Publications Pvt. Ltd.