Course Syllabus
Gyanmanjari Diploma Engineering College
Semester-1

Subject: Surveying – DETCV11201
Type of course: Major Core
Prerequisite: NIL

Rationale:- Before development and planning process for any civil engineering, at first field survey of that area is carried out and various type of survey maps are prepared. These maps and drawing 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	
04	00	02	05	60	30	10	20	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.

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	**Plane Table Survey** Student will set plane table by different orientation methods on given survey station, Project in Plane Table Survey: Prepare map of open vacant land using any plane table method. And upload on GMIU Web Portal.	10
2	**Compass Survey** To Carry out the project for a closed traverse 4 to 5 stations and prepare the drawing sheet using Gale's Table. And upload on GMIU Web Portal.	10
3	**Theodolite survey** Prepare project for hilly area by using Theodolite instrument and make topographic map of contour. And upload on GMIU Web Portal.	10
Total		**30**

Course Content:

Sr. No	Course content	Hrs	% Weightage
1	**Surveying:** General Definition, History of land Surveying, Cardinal principle of survey, uses of surveying in civil engineering, Classification, Different units in surveying. **Scale:** Technical Definition, types and construction and application of different scale in plan and map. **Linear Measurement:** method of measuring distance: direct and indirect, Ranging of survey line, Method of Chaining, Error and mistake in chaining, Correction of length measurement by chain and tape: Incorrect length, alignment, slope. Procedure of Field Work, Conventional Symbols, Procedure & Equipments for Plotting, Computation of Area and volume.	12	20
2	**Compass Traverse:** Introduction, Bearing and angles: technical terms of whole circle bearing, quadrant bearing, for bearing and back bearing., the theory of magnetic compass, types of compass, temporary adjustment of compass, local attraction, compass traverse, adjustment of closing error, precautions. **Plane Table Traverse:** Introduction, Principles, Accessories, advantages and disadvantages, orientation, methods of traversing by plane table.	12	20
3	**Leveling:** Introduction and basic terminology, types of level, components of dumpy level, classification and types of leveling staff., temporary adjustment of leveling, Methods to determine Reduce level by HI method and rise and fall method., Correction of curvature and reflection, **Contouring:** Definition, Uses and Characteristics, Methods of Contouring, Interpolation of contours., Preparing drawing & estimation of gradients Calculation of capacity of reservoirs.	12	20
4	**Theodolite:** General, the Essentials of the transit Theodolite, Definition and terms,. Temporary and Permanent adjustments, Measurement of Horizontal angles: General procedure, Measurement of vertical angles, Deflection angle and ranging of lines in field, Traverse computation and error in Theodolite works, Sources of error in Theodolite works, closing error and balancing of traverse, Gale's tower table.	14	25
5	**Trigonometric Survey:** Introduction, Base of the object are accessible, base of the object inaccessible: instrument stations in a same vertical plane and instrument station are not in same vertical plane.	10	15
Total		**60**	**100**

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%	30%	20%	10%	10%	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	Use basics of Surveying and choose appropriate scale.
CO2	Carry out civil engineering survey using chain and tape, compass & Plane table and prepare drawing.
CO3	Carry out leveling using dumpy level/ Digital level/ Auto level and draw contours.
CO4	Carry out theodolite traverse survey, compute necessary data and draw traverse.
CO5	Compute R.L. of given points using trigonometric survey.

List of Practical

Sr. No	Descriptions	Unit No	Hrs
1	Perform ranging and chaining operations in different field conditions.	01	02
2	Perform chaining and ranging where different types of obstructions are present.	01	02
3	Take offsets (Perpendicular and Oblique) in different field conditions.	01	02
4	Compute area of given plan by Mechanical/ Digital Planimeter.	01	02
5	Perform temporary adjustments of Prismatic Compass.	02	02
6	Determine bearings of different survey lines by using Prismatic Compass.	02	04
7	Determine included angles from measured bearings.	02	02
8	Set plane table by different orientation methods on given survey station.	02	04

9	Project in Plane Table Survey: - Prepare map of open vacant land (min 600 sq.m) using any plane table method.	02	04
10	Perform temporary adjustments of Level Take and record the level reading in the level book Determine Reduced level using both methods by applying checks	03	04
11	Carry out fly levelling in different field conditions.	03	02
12	Carry out profile levelling in different field conditions.	03	02
13	Project in Profile Levelling: Carry out the levelling survey on an undulated ground and prepare the drawing sheet (minimum area under survey (50 m X 60 m).	03	06
14	Identify various parts of the theodolite and Temporary Adjustment of Theodolite.	04	02
15	Measurement of horizontal angle by Repetition & Reiteration.	04	04
16	Measurement of vertical angle & deflection angle.	04	02
17	To Carry out the project for a closed traverse 4 to 5 stations and prepare the drawing sheet using Gale's Table.	04	06
18	Calculation of Height of Object using trigonometry survey.	05	04
	Total		**28**

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 Prakashan
[2] Surveying and Levelling, Vol-II T. P. Kanetkar & S. V. Kulkarni, Puna Vidyarthi Griha Prakashan
[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.
[5] Fundamentals of Surveying, S. K. Roy, PHI Learning Pvt. Ltd
[6] Surveying and Levelling, 2nd Edition, N N Basak, McGraw Hill Education Pvt. Ltd
[7] A Textbook of Surveying and Levelling, R. Agor, Khanna Publishers