LESSON PLAN OF 5TH SEMESTER(2026-27) CIVIL ENGINEERING

Discipline :- CIVIL ENGG.	Semester:5TH	Name of the Teaching Faculty PRIYABRATA TRIPATHY (Lecturer)
Subject:- SURVEYING (TH-1)	No of Days/per Week Class Allotted :-03	Semester From:-01/07/2026 To:- 05/11/2026 No of Weeks:- 19
Week	Class Day	Theory/ Practical Topics
1st	1st	**Overview and Classification of Survey** Survey- Purpose and Use.
	2nd	Types of surveying- Primary and Secondary, Classification: Plane, Geodetic,
	3rd	Cadastral, Hydrographic, Photogrammetry and Aerial
2nd	1st	Principles of Surveying.
	2nd	**Chain Surveying** Instruments used in chain survey: Metric Chain, Tapes, Arrow, Ranging rod,
	3rd	Line ranger, Off-set rod, Open cross staff, Optical square.
3rd	1st	Chain survey Station, Base line, Check line, Tie line, Offset, Tie station
	2nd	Ranging: Direct and Indirect Ranging.
	3rd	Methods of Chaining, obstacles in chaining.
4th	1st	Errors in length: Instrumental error, personal error, error due to natural cause, random error
	2nd	Types of offsets: Perpendicular and Oblique
	3rd	Conventional Signs, Recording of measurements in a field book
5th	1st	**Compass Traverse Survey** Compass Traversing- open, closed.
	2nd	Technical Terms: Geographic/ True Magnetic Meridians and Bearings,
	3rd	Whole Circle Bearingsystem and Reduced Bearing system and examples on conversion of given bearing to anotherbearing (from one form to another),
6th	1st	Fore Bearing and Back Bearing, Calculation of internal and external angles from bearings at a station, Dip of Magnetic needle, Magnetic Declination.
	2nd	Types of Compass-prismatic and surveyor compass
	3rd	Components of Prismatic Compass and Surveyor compass and their Functions, Methods of using Prismatic Compass- Temporary adjustments and observing bearings.
7th	1st	Local attraction, Methods of correction of observed bearings - Correction at station and correction to included angles.
	2nd	Methods of plotting a traverse and closing error, Graphical adjustment of closing error.
	3rd	**Levelling and Contouring** Basic terminologies: Level surfaces, Horizontal and vertical surfaces,

8th	1st	Datum, Bench Marks- GTS, Permanent, Arbitrary and, Temporary, Reduced Level, Rise, Fall, Line of collimation, Station
	2nd	Back sight, Fore sight, Intermediate sight, Change point, Height of instruments.
	3rd	Types of levels: Dumpy, Tilting, Auto level, Digital level,
9th	1st	Components of Dumpy Level and its fundamental axes, Temporary adjustments of Level.
	2nd	Types of Leveling Staff: Self-reading staff and Target staff.
	3rd	Reduction of level by Line of collimation and Rise and Fall Method.
10th	1st	Leveling Types: Simple, Differential, Fly, Profile and Reciprocal Leveling.
	2nd	**Theodolite Surveying** Types and uses of Theodolite, Components of transit Theodolite and their functions, Reading the Vernier of transit Theodolite.
	3rd	Technical terms- Swinging, Transiting, Face left, Face right.
11th	1st	Fundamental axes of transit Theodolite and their relationship
	2nd	Temporary adjustment of transit Theodolite.
	3rd	Measurement of horizontal angle- Direct and Repetition method, Errors eliminated by method of repetition.
12th	1st	Measurement of magnetic bearing of a line, Prolonging and ranging a line, deflection angle.
	2nd	Measurement of vertical Angle. Theodolite traversing by Included angle method and Deflection angle method.
	3rd	Checks for open and closed traverse, Calculations of bearing from angles.
13th	1st	Traverse computation-Latitude, Departure, Consecutive coordinates, Independent coordinates,
	2nd	balancing the traverse by Bowditch's rule and Transit rule, Gale's Traverse table computation. (Simple numerical problems and concept only)
	3rd	**Tacheometric surveying and Curve setting** Principles of Tacheometry, Anallatic lens.
14th	1st	Tacheometric formula for horizontal distance with telescope horizontal and staff vertical.
	2nd	Field method for determining constants of tacheometer,
	3rd	Determining horizontal and vertical distances with tacheometer by fixed hair method and staff held vertical, Limitations of tacheometry.
15th	1st	Types of curves used in roads and railway alignments. Designation of curves.
	2nd	Setting simple circular curve by offsets from long chord and Rankine's method of deflection angles.
	3rd	**Advanced surveying equipment** Principle of Electronic Distance Meter (EDM), its
16th	1st	component parts and their Functions, use of EDM.
	2nd	Use of micro optic Theodolite and Electronic Digital Theodolite.
	3rd	Use of Total Station, Use of function keys.

17th	1st	Measurements of Horizontal angles, vertical angles, distances and coordinates using Total
	2nd	Station, Traversing, Profile Survey and Contouring with Total Station.
	3rd	**Remote sensing, GPS and GIS** Remote Sensing – Overview, Remote sensing system, Applications of remote sensing in Civil engineering, land use / Land cover,
18th	1st	mapping, disaster management. Use of Global Positioning System (G.P.S.) instruments, and DGPS
	2nd	Geographic Information System (GIS): Over view, Components, Applications, Software for GIS.
	3rd	Introduction to Drone Surveying.
19th	1st	Problem practice
	2nd	Problem practice
	3rd	Problem practice

23/06/26
LECTURER

PRINCIPAL 23/6/26

Principal
GIET (Polytechnic)
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23.06.2026
SR.LECTURER

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