

Lesson Planning (Theory)

Branch : Civil Engineering

Semester : 3rd

Subject : Basic Surveying

Session : August-December 2026

Teacher: Er. Rana Kunal

Class Room : A-202

S.No.	No. of WEEKS	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1	3 WEEKS	Unit –1 Overview and Classification of Survey	- Survey- Purpose and Use. - Types of surveying- Primary and Secondary, Classification: Plane, Geodetic, Cadastral, Hydrographic, Photogrammetry and Aerial. - Principles of Surveying. - Scales: Engineer's scale, Representative Fraction (RF) and diagonal scale.	R1,R2	
2	3 WEEKS	Unit– 2 Chain Surveying	- Instruments used in chain survey: Metric Chain, Tapes, Arrow, ranging rod, Line ranger, Offset rod, Open cross staff, Optical square. - Chain survey Station, Base line, Check line, Tie line, Offset, Tie station. - Ranging: Direct and Indirect Ranging. - Methods of Chaining, obstacles in chaining. - Errors in length: Instrumental error, personal error, error due to natural cause, random error. - Principles of triangulation. - Types of offsets: Perpendicular and Oblique. - Conventional Signs, Recording of measurements in a field book.	R1,R2	
3	3 WEEKS	Unit– 3 Compass Traverse Survey	Compass Traversing- open, closed. - Technical Terms: Geographic/ True Magnetic Meridians and Bearings, Whole Circle Bearing system and Reduced Bearing system and examples on conversion of given bearing to another bearing (from one form to another), Fore Bearing and Back Bearing, Calculation of internal and external angles from bearings at a station, Dip of Magnetic needle, Magnetic Declination. - Components of Prismatic Compass and their Functions, Methods of using Prismatic Compass-Temporary adjustments and observing bearings. - Local attraction, Methods of correction of observed bearings - Correction at station and correction to included angles.	R1,R2	
4	3 WEEKS	Unit– 4 Leveling and Contouring	Basic terminologies: Level surfaces, Horizontal and vertical surfaces, Datum, Benchmarks- GTS, 8 Permanent, Arbitrary and Temporary, Reduced Level, Rise, Fall, Line of collimation, Station, Back sight, Fore	R1,R2	

			sight, Intermediate sight, Change point, Height of instruments. • Types of levels: Dumpy, Tilting, Auto level, Digital level, Components of Dumpy Level and its fundamental axes, Temporary adjustments of Level. • Types of Levelling Staff: Self-reading staff and Target staff. Reduction of level by Line of collimation and Rise and Fall Method. • Levelling Types: Simple, Differential, Fly, Profile and Reciprocal Levelling. Contour, contour intervals, horizontal equivalent. • Uses of contour maps, Characteristics of contours, Methods of Contouring: Direct and indirect		
5	2 WEEKS	Unit– 5 Measuremen t of Area and Volume	• Components and use of Digital planimeter. • Measurement of area using digital planimeter. • Measurement of volume of reservoir from contour map.	R1,R2	

REFERENCE RESOURCES

- Punmia, B.C, Jain, Ashok Kumar; Jain, Arun Kumar, Surveying I, Laxmi Publications, New Delhi.
- Basak, N. N., Surveying and Levelling, McGraw Hill Education, New Delhi.

Signature of Teacher

Signature of H.O.D/OIC