

Survey - II
BEG259CI

YEAR-II

SEMESTER-II

Teaching Schedule			Examination Scheme						Total Marks
			Final				Internal Assessments		
Hours/Week			Theory		Practical		Theory Marks	Practical Marks	
L	P	T	Duration	Marks	Duration	Marks			
3	4	1	3	80	-	25	20	25	150

Course Objectives:

After the completion of this course the students will be able to:

- Apply the basic principle of surveying for land characterization,
- Gain general and theoretical knowledge on plane and topographical surveying of small area,
- Carry out mapping works by both digital and graphical means.

Course Contents:

1.0 Traversing

(6hrs)

- 1.1 Principles and importance of traversing, types of traverse
- 1.2 Field works for traversing and booking of field notes
- 1.3 Reduction of reading to angle and bearing
- 1.4 Angular misclosure and Closing Error
- 1.5 Traverse adjustment and computation for closed and link traverse -Gale's Table
- 1.6 Plotting of traverse survey
- 1.7 Omitted measurements in traversing
- 1.8 Instructions to field applications

2. Tacheometry(5 hrs)

- 2.1 Definitions
- 2.2 Principle of optical distance measurements
- 2.3 Systems of tacheometric measurements-Stadia method and tangential method using vertical staff
- 2.4 Subtense bar
- 2.5 Booking and plotting of details
- 2.6 Sources of errors and precision of tacheometric survey
- 2.7 Instruction on field work

3. Trigonometric Leveling

(4 hrs)

- 3.1 Problems of heights and distances
- 3.2 Plane and geodetic trigonometric leveling
- 3.3 Significance and error ratio
- 3.4 Instruction on field applications

4. Contouring

(4hrs)

- 4.1 Introduction
- 4.2 Contour interval and characteristics of contours
- 4.3 Methods of contouring (direct and indirect)
- 4.4 Interpolation of contours
- 4.5 Use of contour map
- 4.6 Instruction on field works
- 5. Orientation (3hrs)**
- 5.1 Introduction
- 5.2 Analytical intersection and resection
- 5.3 Two point and three point problems and their significance
- 5.4 Use of geodetic control points
- 5.5 Instruction on field applications
- 6. Curves (10 hrs)**
- 6.1 Classification of curves and their common uses
- 6.2 Elements of simple circular curves
- 6.3 Setting out of simple circular curves by ordinate from long chord, by offset from tangents and by deflection angle methods
- 6.4 Geometry of transition curves and their elements
- 6.5 Elements of vertical curves and computation of reduced levels of points on curve
- 6.6 Instruction on field applications
- 7. Triangulation and Trilateration (4hrs)**
- 7.1 Introduction
- 7.2 Principal of triangulation
- 7.3 Purpose of triangulation
- 7.4 Classification of triangulation
- 7.5 Layout of triangulation
- 7.6 Fieldwork of triangulation
- 8. Photogrammetry and Remote Sensing (3 hrs)**
- 8.1 Introduction to Photogrammetric as a branch of surveying
- 8.2 Types of aerial photographs
- 8.3 Scale of vertical photograph
- 8.4 Relief displacement
- 8.5 Merits and limitations of Photogrammetric
- 8.6 Introduction to remote sensing
- 9. Field Astronomy and GPS System (2 hrs)**
- 9.1 Celestial sphere and spherical triangle
- 9.2 Characters of spherical triangles
- 9.3 Merits of field astronomy and GPS system for horizontal control in civil engineering problems
- 10. EDM (2 hrs)**
- 10.1 Basic definition
- 10.2 Classification of EDM instruments
- 10.3 Principle of Electronic Distance Measurement
- 11. Total Station (2 hrs)**

- 11.1 Introduction
- 11.2 Features of total station
- 11.3 Electronic data recording
- 11.4 Summary of total station characteristics
- 11.5 field procedures for total station in topographical surveying

Laboratories:

There shall be eight laboratory exercises in this course:

- (i) Traverse survey, computation and plotting
- (ii) Application of tachometry to measure distance and elevation by the stadia system including detailing, computation, plotting and contouring
- (iii) Intersection and resection using theodolite.
- (iv) Establishing of control points by triangulation and Trilateration.
- (v) Trigonometric leveling.
- (vi) Setting out of simple circular curve, transition curve.
- (vii) Demonstration and application of total station.
- (viii) Demonstration and application of GPS.

Requirements:

The number of students in each group should not be more than five. A facilitator should not response more than three groups.

References:

- Banister, A. & Raymond, S., "Surveying", ELBS Publication
- Punima, B. C., "Surveying", Khanna Publishers
- Agor, R., "A Text Book of Surveying and Leveling", Khanna Publishers
- Dr. Arora K. R. , "Surveying", Standard Book House, Delhi