Survey-I
BEG258CI

Year: II **Semester: I**

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

Course Objective:
The course in land surveying will taught in three consecutive semesters. Course deal with basic principle of land surveying. Conventional methods of surveying will be discussed in length.
After the completion of this course, the students will be able to

- Understand the fundamental principle of land surveying
- Handle different types of surveying instruments.

Course Contents:

1. Introduction **(3 hrs)**

1.1 Introduction to surveying and its importance to civil engineering
1.2 History and the development of surveying
1.3 Classification of surveying
1.4 Principles of surveying
1.5 Plans and Maps
1.6 Introduction to scales used in surveying

2. Distance Measurements **(5 hrs)**

2.1 Types of measurements
2.2 Units of measurements, system of units, significance figures and rounding of numbers
2.3 Distance measurement techniques and instruments used
2.4 Errors, types of errors and sources of errors in making measurements
2.5 Precision and accuracy
2.6 Corrections for linear measurements

3. Tape and Offsets Surveying **(5 hrs)**

3.1 Basic principles and geometry of area measurement
3.2 Terms used in chain surveying
3.3 Field booking methods
3.4 Obstacles in chaining
3.5 Conventional symbols

4. Compass Surveying **(8 hrs)**

4.1 Introduction to compass surveying
4.2 Meridians, Bearings and angles
4.3 Designation of bearings
4.4 Types of compass
4.5 Local attraction
4.6 Magnetic declination and its variations
4.7 Closing error and adjustments
4.8 Traverse plotting: By parallel meridians and By included angles

5. Leveling **(10 hrs)**

5.1 Introduction

5.2 Basic principles and importance of leveling
5.3 Different methods of determining elevations
5.4 Leveling instruments and accessories
5.5 Two peg test
5.6 Temporary and permanent adjustment of level
5.7 Booking methods and their reductions, arithmetic checks
5.8 Curvature and refraction
5.9 Uses of leveling; profile leveling, cross-sectioning and fly leveling and contouring
5.10 Adjustment of level circuits and Sources of errors in leveling

6. Plane Table Surveying (2 hrs)

6.1 Principle of plane table surveying
6.2 Methods of plane tabling
6.3 Advantages and disadvantages of plane tabling

7. Introduction to Theodolite (5 hrs)

7.1 Introduction to Theodolite
7.2 Basic definitions
7.3 Temporary adjustment of Theodolite
7.4 Measurement of horizontal angles by direction and repetition methods
7.5 Measurement of vertical angles
7.6 Fundamental lines of Theodolite and its geometry
7.7 Sources of errors

8. Computation of Area and Volume (5 hrs)

8.1 Basic definition
8.2 Area by division into simple figures
8.3 Area by coordinates, area by double meridian distance method and trapezoidal and Simpson's 1/3 rule
8.4 Measurement of volume by trapezoidal and prismoidal method

9. Field Astronomy and GPS (2 hrs)

9.1 Introduction, definition of terms
9.2 Geographical coordinate system
9.3 Introduction and components of GPS

Laboratories:

Following six field exercises will be performed in this course:

(i) A field survey using tape by direct and indirect methods
(ii) Compass traversing and detailing
(iii) A field survey using level to transfer RL (Fly Leveling)
(iv) A field survey using level to determine profile and cross-section
(v) Traversing and detailing by plane tabling
(vi) Measurement of horizontal and vertical angles using Theodolite

Requirements:

The number of students in each group should not be more than five (5 nos.). 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"