## CIPC2002 ENGINEERING SURVEY (3-0-0)

**Course Objectives:**

1. Ability to apply different methods of surveying suitable for a location and application
2. Ability to use different conventional and modern surveying instruments
3. Learn about referencing system, horizontal and vertical control for topographic mapping.
4. Understand different problems, issues and errors associated with survey data
5. Ability to record, analyze survey data, and check, remove and distribute survey errors.

**Module-I**

*Linear measurements and chain surveying*: Definition of surveying, classification of surveys, scales, types of chains and tapes, chaining and ranging, principles of chain survey, instruments, applications, errors and corrections, obstacles in chaining.

**Module-II**

*Compass Traversing*: Measurement of bearing, computation of angles from bearings, designation of bearings, fore bearing and back bearing, prismatic compass, principles of compass survey, local attraction and corrections, compass traverse and adjustments.

**Module- III**

*Levelling and contouring*: Principle, levelling instruments, dumpy level, classification of levelling, booking and reducing levels, profile and reciprocal levelling, curvature and refraction corrections, bubble tube and its sensitiveness, levelling difficulties, definition of contouring, contour interval, characteristics of contours, direct and indirect methods of contouring, interpolation of contours, contour gradient, uses of contour maps.

**Module- IV**

Theodolite Survey: Use of theodolite, temporary adjustment, measuring horizontal and vertical angles, theodolite traversing, included angles from bearings, fundamental lines and desired relations, errors in theodolite work.

**Module- V**

Modern Surveying Instruments: Electronic Distance Measurement, Corrections to measurement, Digital Theodolite, Total Stations, Global Positioning System, Introduction to Remote Sensing and GIS (Brief Introduction).

**Course Outcome:**

After this course the student shall:

- Apply the concepts of linear distance measurement for establishing the position of a point on ground.
- Able to find the angular measurement.

- Apply the concepts of height measurement to establish the vertical coordinate of a point on earth and prepare the contour map.
- Able to use theodolite to establish the spatial coordinates of a point on ground.
- Understand and apply modern equipment and technique for engineering survey.

**Text Books:**


1. Punmia, B.C., Jain, A.K. and Jain, A.K., Surveying Vol. I and II, Laxmi Publications (2016)
2. Surveying Vol-1 by R Agor, Khanna Publishers


**Reference Books:**


1. Chandra, A.M., Surveying Problem Solving, New Age International
2. Subramanian, R., Surveying and Leveling, Oxford University Press