

PRINCIPLES OF GEOINFORMATICS

2-0-2-0-8

Basic concepts of surveying: Objectives; Basic measurements, control networks, locating topographic details; Units of measurement; Error in measurement and their types, indices of precision, weight, outliers; Error sources, types; accuracy and precision, propagation of variance/covariance

Linear measurements: Taping; Optical distance measurement; Electronic distance measurement, classification and calibration; Errors in distance measurement and precautions

Vertical control: Level surface; Levelling principles, determination of height, leveling instruments; Sources of error and minimization, curvature and refraction effects; closure tolerances; Types of leveling; Characteristics of contours; methods of contouring

Angle measurements: Concept of direction, azimuth, meridian; Theodolite, fundamental characteristic of theodolite and adjustment, measuring angles, sources of error, Total Station surveys

Adjustments: Adjustment of errors using observation equation and condition equation approach (matrix-based solution)

Control surveys: Traversing, Triangulation, Trilateration, and Triangulation: types, field procedure, error minimization

Coordinate systems and datum transformation: Important surfaces in geodesy: earth surface, geoid, MSL, reference ellipsoid; Reference systems: 2D and 3D coordinate systems and transformations; map projection, UTM projection