

## ADJUSTMENT COMPUTATIONS FOR GEOINFORMATICS-I

1.5-0-1-0-6

Adjustment computations: Introduction, Observation/measurements: True value, Most probable value (MPV) True error, residual, discrepancy, Types and sources of error, Gaussian law of accidental errors, Precision and accuracy, Measures of precision from Gaussian law, Expectation operator, Variance, Covariances, Correlation, Weights and cofactors, Various error measures on 1D, 2D, and 3D standards, Propagation of errors, variance, covariance and cofactors, Pre-analysis, Introduction to Statistical concepts, Probability distributions, Hypothesis testing. Geoinformatics methodology: Mathematical model, Definition, elements and Types of models: stochastic and function, linear, non-linear, over-determined, under-determined, unique, explicit, implicit, observation, condition, combined, Adjustment: Purpose and types, Least squares adjustment: Principle and techniques, Assumptions, Ordinary, weighted, generalized LS, Geometrical interpretation. Observation equations: Model and solution strategy, Adjustment of linear and non-linear forms, Variance-covariance propagation of adjusted data in observations equations method Condition equation: Model and solution strategy, Adjustment of linear and non-linear forms, Variance-covariance propagation of adjusted data in condition equations method. Combined method: Model and solution strategy, Variance-covariance propagation of adjusted data in combined equations method Observation and condition equations as simplification of combined method. Post-analysis of adjusted data: Absolute and relative error ellipse and error ellipsoid, Significance and use in designing projects, outlier/blunder detection, redundancy, redundancy number, reliability, and sensitivity analysis. Applications of adjustment computations: Traversing, Tachometry, EDM, Photogrammetry, GNSS, Network adjustment. Introduction to Geostatistics: Geostatistical tools: Semivariance, Variogram, various models Kriging.