Engineering Mathematics

**Linear Algebra**: Matrix algebra, Systems of linear equations, Eigen values and eigenvectors.

**Calculus**: Functions of single variable, Limit, continuity and differentiability, Mean value theorems, Evaluation of definite and improper integrals, Partial derivatives, Total derivative, Maxima and minima, Gradient, Divergence and Curl, Vector identities, Directional derivatives, Line, Surface and Volume integrals, Stokes, Gauss and Green's theorems.

**Complex Variables**: Analytic functions, Cauchy's integral theorem, Taylor and Laurent series.

**Probability and Statistics**: Definitions of probability and sampling theorems, Conditional probability, Mean, median, mode and standard deviation, Random variables, Exponential, Poisson, Normal and Binomial distributions.

**Geo-Engineering**: Continents. Earth composition. Earth - Orbit, Oceans - Depth, Bottom, Relief


**Surveying methods**: Topographic surveying, Theodolite applications, topographic sheets, aerial photo formats Maps: Types of photographs: vertical and oblique photographs. Aerial cameras: lens, optical axis, focal length, focal plane and fiducial marks; Principal Point; Geometry of vertical photographs map projections, fundamentals of cartography.

**Physical principles of remote sensing, electromagnetic spectrum**:


**GIS concepts**:


*****