

## PhD 2024 - General Engineering Syllabus

**Quantitative Aptitude:** Data interpretation: data graphs (bar graphs, pie charts, and other graphs representing data), 2- and 3-dimensional plots, maps, and tables. Numerical computation and estimation: ratios, percentages, powers, exponents and logarithms, permutations and combinations, and series Mensuration and geometry Elementary statistics and probability.

**Analytical Aptitude Logic:** Deduction and induction, Analogy, Numerical relations, and reasoning

**Spatial Aptitude:** Transformation of shapes: translation, rotation, scaling, mirroring, assembling, and grouping Paper folding, cutting, and patterns in 2 and 3 dimensions

**Linear Algebra:** Algebra of matrices, determinants, rank of matrices, system of linear equations, eigenvalues and eigenvectors, LU decomposition.

**Probability:** Axiomatic definition of probability, properties of probability function, conditional probability, Bayes' theorem, independence of events; Random variables and their distributions, distribution function.

**Data Analysis and Interpretation:** Introduction to Data Analysis, Data Collection Methods, Descriptive Statistics-Mean, Median, Mode, Std Deviation, Variance, Kurtosis, Skewness, Inferential Statistics- hypothesis testing, z-test, t-test, chi-squared test, Data Visualization bar plot, line plot, scatter plot, box plot, pie-chart, Interpreting Statistical Results

**Basics of Programming:** Computational thinking, Concepts of logical Thinking and Algorithms, Flow charts, Objectives of Problem Solving, Defining a problem, devising solutions, Flowchart.