

Contents of mathematics courses

For the New Curriculum

Level 1

Mathematics 1: 3(3,0)

Sets, Functions and their graphs, conic sections, limits, continuity, Definition of the derivative. Differentiation rules. Applications of Differentiation, asymptotes, curve sketching. Introduction to Integrals.

Level 2

Mathematics 2: 3(3,0)

Techniques of integration, improper integrals, Applications of integrations. Infinite sequences and series, power series, Taylor and Maclaurin series, the binomial series (Positive, fractional, negative power).

Level 3

Multi Variable Calculus: 3 (4,0)

Vectors, Coordinates (Cartesian, Cylindrical and Spherical), Vector functions, vector calculus (gradient, divergent, curl vectors). Functions with multi-variables. Partial derivatives, multiple integration with applications in calculating surface area, line and surface integrals, Green's theorem with applications, Stokes' Theorem, Gauss' Theorem with applications.

Level 4

Mathematical methods:4 (5,0)

Fourier analysis (Fourier series and Fourier integrals).Laplace transform, Z-transform, Introduction to Special functions (Gamma - Beta – Bessel – Legenders – hermits – laguerr - polynomial) . Introduction to complex variables, introduction to graph theory.

Level 5

Differential equations: 4(4,0)

Introduction to differential Equations (DE), classification of DE, DE sources, First-Order DE, Homogeneous DE, Exact and non Exact DE, Bernoulli DE, Riccati DE, Higher-Order ODE, differential equation with constant coefficient (inverse D operator, variation of parameters, undetermined coefficient), differential equation with variable co-coefficient, real-world engineering problems, Sturm liouville problem, Partial differential equations with applications.

LEVEL 6

Numerical Analysis: 3 (4,0)

Error analysis, interpolation, numerical integration, roots of equations, systems of linear equations, system of nonlinear equations, Numerical solution of ordinary differential equations (initial and boundary value problems). All subjects with engineering applications using Matlab.

Probability and Statistics: 3 (4,0)

Introduction to statistics, frequency distributions, graphs of frequency distributions, central tendency measures, Measures of Dispersion with an emphasis on solving problems in computer science and engineering. basic concepts of probability, elementary probability theorems, conditional probability, Bay's theorem, discrete and continuous random variables, discrete and continuous probability distributions, estimating methods, correlation, regression, and hypothesis testing, engineering applications.

LEVEL 7

Linear Algebra: 2 (3,0)

Matrices and basic matrix operations, determinants, System of linear equations, eigenvalues and eigenvectors, linear dependence and independence, orthogonality, Vector spaces and linear transformations, Norms, and inner products, introduction to linear programming, engineering applications.