

M.Tech - Other than IMsc. (Electives)

MA5540 PROBABILITY AND STATISTICS

Probability calculus- Random variables- Standard discrete and continuous distributions- Expectation- Moments- Law of large numbers.

Data presentation- Frequency distributions and their characteristics- sampling distributions- Point and interval estimation- Tests of hypotheses- Large and small sample tests.

Curve fitting- Simple correlation and regression.

MA5720 NUMERICAL ANALYSIS OF DIFFERENTIAL EQUATIONS

Ordinary Differential Equations:Initial value problems- basic theory and application of multistep methods (explicit and implicit), stability analysis- zero stability, absolute stability, relative stability and intervals of stability, eigenvalue problems, predictor- corrector methods, Runge-Kutta methods, boundary value problems-shooting methods.

Partial Differential Equations:

- (a) Parabolic Equations:Explicit and implicit finite difference approximations to one-dimensional heat equation, Alternating Direction Implicit (ADI) methods.
- (b) Hyperbolic equations and Characteristics: Numerical integration along a characteristic, equations, numerical solution by the method of characteristics, finite difference solution of second order wave equation.
- (c) Elliptic equations: finite difference methods in polar coordinates, techniques near curved boundaries, improvement of accuracy- direct and iterative schemes to solve systems, methods to accelerate the convergence.
- (d) Convergence, consistency and stability analysis.
