

TCIS Hyderabad

Course : Mathematical Methods
Credits : 4
Coordinates : Tuesday & Wednesday 09.30 - 11.00 hrs.
Contact Hours : 48 hrs.
Instructor/s : P.K.Madhu and Rajalakshmi.G

Syllabus

- **Determinants and Matrix Algebra:** Properties of determinants and matrices, Linear transformation, Eigenvector-Eigenvalue problems, Similarity and unitary transformations
- **Differential Equations:** Separable, Exact, and First-order homogeneous linear differential equations, Sturm-Liouville eigenvalue problem, Legendre polynomials and properties, Spherical harmonics, Bessel equations and properties
- **Vector Algebra:** Gradient, Divergence, Curl, Gauss and Stokes theorem, Curvilinear coordinates, Tensor analysis
- **Complex Analysis:** Cauchy-Riemann conditions, Analytic functions, Contour integrals, Taylor and Laurent series, Singularities, Residue theorem, Gamma and Beta function, Method of steepest descent, Stirling series, asymptotic series, Convergence tests
- **Integral Transforms:** Fourier series, Fourier transform, Laplace transform, Solution of initial boundary-value problem, Convolution
- Error Analysis