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ME 261(AUG) 3:0 Engineering Mathematics

Instructor(s): Venkata R Sonti, Gaurav Tomar & Koushik Viswanthan, C S Jog

Course description:

Vector and tensor algebra: Sets, groups, rings and fields, vector spaces, basis, inner products, linear transformations, spectral decomposition, tensor algebra, similarity transformations, singular value decomposition, QR and LU decomposition of matrices, vector and tensor calculus, system of linear equations (Krylov solvers, Gauss-Seidel), curvilinear coordinate transformations. Ordinary and partial differential equations: Characterization of ODEs and PDEs, methods of solution, general solutions of linear ODEs, special ODEs, Euler-Cauchy, Bessel's and Legendre's equations, Sturm-Liouville theory, critical points and their stability. Complex analysis: Analytic functions, Cauchy-Riemann conditions and conformal mapping. Special series and transforms: Laplace and Fourier transforms, Fourier series, FFT algorithms, wavelet transforms

Prerequisites:

Kryyzig E, Advanced Engineering Mathematics, C.R. Wylie, Advanced Engineering Mathematics, M.D. Greenberg

Resources:

Outcomes:

Additional information:

Course website: