

Credit Course
Mathematics
Computational Numerical and Statistical Methods by using MATLAB

Unit - 1: Curve Fitting

Fit linear, curvilinear and exponential models to univariate data. Method of Least Squares.

Unit - 2 Matrix Methods

Matrix Diagonalization, Eigen value and eigen vectors, Methods to find largest eigenvalue.

Gauss seidal, Jacobi methods to solve linear system of equations.

Unit - 3 Ordinary Differential Equations

Series Solution methods - Picards and Taylor methods. Single step and Multistep methods - Predictor and corrector methods.

Unit - 4 Partial Differential Equations

Elliptic, Parabolic and Hyperbolic equations - Explicit and Implicit Methods - Crank Nicholson and Smidth methods. Solutions to Laplace equations by using Gauss Seidal and Jacobi methods.

Unit - 5 Distributions

Random Variables from Common Probability Distributions - Fitting binomial, Poisson and normal distributions

Unit - 6 Design of Experiments

Correlation and Regression. Design of Experiments - Factor Analysis and ANOVA

Unit - 7 : Hypothesis Testing

Null and alternative hypothesis, Operating Characteristic curves. Tests of means, proportions and variances. Confidential Intervals.

Unit - 8 : Statistical Pattern Recognition

Bayes Decision Theory - Evaluating the Classifier - Classification Trees - clustering methods

Reference Books

- 1) Rizwan Bhatt, Introduction to Numerical Analysis using MATLAB, Infinity Science Press.
- 2) Wendy L. Martinez and Angel R. Martinez, Computational Statistics Handbook with MATLAB, CHAPMAN & HALL/CRC, Boca Raton London New York Washington, D.C.