JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

Syllabi for Ph.D Credit Courses

Mathematics

Subject Code: 1491 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.