Course Name: MATHEMATICS AND STATISTICS

Course Code: ES1043

Credits: 3	**Teaching Scheme: Theory: 3 Hours / Week** **Tutorial: 1 Hour / Week**

Section I

Vector Spaces: Rank of matrix, Elementary Matrices, System of linear equations.

Euclidean Vector space, Vector Space, Subspace, Span of a set, Spanning Set, Fundamental Subspaces, Linear Dependence, Independence, Basis and dimension of a vector space

Linear Transformation: Definition, Kernel, Range, Matrix of Linear Transformation, One-one, Onto transformation, Geometric transformations in R^2 and R^3.

Eigen Values and Eigen Vectors: Eigen Values and Eigen Vectors of a matrix, Diagonalization, Symmetric Matrices, Orthogonal Matrix, Orthogonal Diagonalization

Section II

Functions of two or more variables: Introduction to functions of two or more variables, limits and continuity (only introduction), Partial derivatives, chain rules, maxima and minima of functions of two variables.

Higher order Linear Differential equations: First order linear ode, Second order ODEs and its applications: Homogeneous Linear ODE's, Non homogeneous ODE's.

Statistics: Descriptive Statistics: Data types, Data presentation, Data Distribution, Measures of central tendency, Data shapes, Data visualization

Random Variable: random variable-Discrete and continuous, probability mass function, probability density functions, expectation and variance of distribution, covariance and correlation coefficient.

Text Books:

1. Ron Larson and David C. Falvo, ' Linear Algebra :An Introduction',1st Edition, Cengage Learning (Indian Edition).
2. Ron Larson and Bruce H. Edwards, 'Text book of Calculus', Brooke/Cole, a part of Cengage Learning (Indian Edition), (c) 2011.
3. Erwin Kreyszig, 'Advanced Engineering Mathematics'10th Edition, Dec. 2010, , John Wiley and sons, Inc.

Reference Books:

1. David C. Lay, 'Linear Algebra and its Applications', 3rd Edition, Pearson.
2. Jim DeFranza and Daniel Gagliardi, 'Introduction to Linear Algebra with Applications', Tata McGraw-Hill Edition.
3. Gilbert Strang, 'Linear Algebra and its Applications', 4th Edition, Cengage Learning.
4. B.V. Ramana, 'Higher Engineering Mathematics' Tata McGraw-Hill publishing co. Ltd.
5. Michael D. Greenberg; Advanced Engineering Mathematics; Pearson Education Asia