

RK Sinha

# NATIONAL INSTITUTE OF TECHNOLOGY PATNA

(Ashok Rajpath, Patna, Bihar – 800 005)

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## Department of Computer Science and Engineering

### Semester - II

**Course Name: Engineering Mathematics – II (MA24102)      L-T-P-C: 3-0-0-3**  
**Total Lectures: 42**

#### **Detailed Syllabus:**

Axiomatic construction of the theory of probability, independence, conditional probability, and basic formulae, random variables, probability distributions, functions of random variables; Standard univariate discrete and continuous distributions and their properties, mathematical expectations, moments, moment generating function, characteristic functions; Random vectors, multivariate distributions, marginal and conditional distributions, conditional expectations; Modes of convergence of sequences of random variables, laws of large numbers, central limit theorems. Descriptive statistics, graphical representation of the data, measures of location and variability. Population, sample, parameters. Point estimation; method of moments, maximum likelihood estimator, unbiasedness, consistency. Confidence intervals for mean, difference of means, proportions. Testing of hypothesis; Null and Alternate hypothesis.

#### **Texts:**

1. Robert V. Hogg, J.W. McKean, and Allen T. Craig: Introduction to Mathematical Statistics, Seventh Edition, Pearson Education, Asia.
2. Edward J Dudewicz and Satya N. Mishra: Modern Mathematical Statistics, Wiley.
3. W. Feller, An Introduction to Probability Theory and its Applications, Vol. 1, 3rd Edition, Wiley, 1968.
4. Sheldon M. Ross, "A first course in Probability," Prentice-Hall, 6ed, 2001