



| Code     | Subject Title                      | Cr. Hrs | Semester |
|----------|------------------------------------|---------|----------|
| STAT-316 | Probability Distributions (Theory) | 3       | VI       |
| Year     | Discipline                         |         |          |
| 3        | Statistics-I,II,III                |         |          |

| Code     | Subject Title                   | Cr. Hrs | Semester |
|----------|---------------------------------|---------|----------|
| STAT-317 | Probability Distributions (Lab) | 1       | VI       |
| Year     | Discipline                      |         |          |
| 3        | Statistics-I,II,III             |         |          |

### **Probability Distributions**

#### **Course Outline**

Continuous distributions: continuous uniform, normal, exponential, gamma, beta, lognormal, Weibull, Pareto and Cauchy distributions and their properties.

Bivariate distributions. Marginal distribution. Conditional distribution and independence. Conditional expectation and conditional variance. Bivariate normal distribution and its properties.

Transformation of random variables. Sum, product and quotient of random variables. Moment generating function techniques. Derivations of chi-square, t and F distributions and their properties. Order statistics, Distribution of the rth order statistics. Distribution of sample range, sample median and sample mid-range.

#### **Books Recommended**

1. Hogg, R.V. and Craig, A.T., "Introduction to Mathematical Statistics" Prentice-Hall International, Inc. Engle Wood Cliffs, N.T., Fifth Edition, 1995.
2. Mood, A.M., Graybill, F.A. and Boes, D.C. "Introduction to the Theory of Statistics" McGraw-Hill Book Company, New York, Third Edition, 1974.

#### **Reference Books**

1. J. Susan Milton and Jesse C. Arnold, "Introduction to probability and statistics", McGraw Hill, 2003.
2. Sheldon, M. Ross, "Introduction to probability modes", Academic press, 2003.
3. Dudewicz, E.J. and Misra, S.N. "Modern Mathematical Statistics" John Wiley and Sons, New York, 1988.
4. Hogg, R.V. and Tanis, E.A. "Probability and Statistical Inference" McMillan Publishing Company, New York, Forth Edition, 1993.
5. Stuart, A. and Ord, J.K. "Kendall's Advanced Theory of Statistics Vol.-I" Edward Arnold, London, Sixth Edition, 1994.