

## **CA1T4: PROBABILITY AND STATISTICS**

**UNIT I: Probability** - Sample space and events – Probability – The axioms of probability - Some elementary theorems - Conditional probability – Baye's theorem.

**UNIT II: Random variables** – Discrete and continuous – Distribution – Distribution function.

**UNIT III: Distribution** - Binomial, Poisson and normal distribution – related properties.

**UNIT IV: Sampling distribution** - pulations and samples - Sampling distributions of mean (known and unknown) proportions, sums and differences.

**UNIT V: Estimation** - Point estimation – interval estimation - Bayesian estimation.

**UNIT VI: Test of Hypothesis** – Means and proportions – Hypothesis concerning one and two means – Type I and Type II errors. One tail, two-tail tests.

**UNIT VII: Tests of significance** – Student's t-test, F-test,  $\chi^2$  test. Estimation of proportions.

**UNIT VIII: Curve fitting:** The method of least squares – Inferences based on the least squares estimations - Curvilinear regression – multiple regressions – correlation for univariate and bivariate distributions.

### **Text Books:**

1. Probability and statistics for engineers: Erwin Miller And John E.Freund. Prentice-Hall of India / Pearson , Sixth edition.
2. Probability, Statistics and Queuing Theory, 2nd Edition, Trivedi, John Wiley and Sons.

### **References:**

1. Fundamentals of Mathematical Statistics, S.C.Gupta, V.K.Kapoor . Sultan Chand
2. V.K Rohtagi and A.K. Saleh, **An Introduction to Probability and Statistics** (2nd ed.), John Wiley & Sons, 2005
3. A.M. Goon, M.K. Gupta and T.S. Dasgupta, **An Outline of Statistical Theory** (2nd ed.), Vol. II, The World Press Pvt. Ltd., 2000