M.A/M.Sc Mathematics Semester 4th

Effective from academic session 2011 ⟹ **Repetition for 2012 with minor change**

MATHEMATICAL STATISTICS

Course No. MM-OP-407

Unit I

Some Special Distributions, Bernoulli, Binomial, Trinomial, Multinomial, Negative Binomial, Poisson, Gamma, Chi-square, Beta, Cauchy, Exponential, Geometric, Normal and Bivariate Normal Distributions.

Unit II

Distribution of Functions of Random Variables, Distribution Function Method, Change of Variables Method, Moment generating function Method, t and F Distributions, Dirichelet Distribution, Distribution of Order Statistics, Distribution of X and $\frac{nS^2}{\sigma^2}$, Limiting distributions, Different modes of convergence, Central Limit theorem.

Unit III

Interval Estimation, Confidence Interval for mean, Confidence Interval for Variance, Confidence Interval for difference of means and Confidence interval for the ratio of variances. Point Estimation, Sufficient Statistics, Fisher-Neyman criterion, Factorization Theorem, Rao-Blackwell Theorem, Best Statistic (MvUE), Complete Sufficient Statistic, Exponential class of pdfs.

Unit IV

Rao-Crammer Inequality, Efficient and Consistent Estimators, Maximum Likelihood Estimators (MLE's).

Testing of Hypotheses, Definitions and examples, Best or Most powerful (MP) tests, Neyman Pearson theorem, Uniformly most powerful (UMP) Tests, Likelihood Ratio Test, Chi-square Test.

Recommended Books

1 Hogg and Craig : An Introduction to Mathematical Statistics

2 Mood and Grayball : An Introduction to Mathematical Statistics

Suggested Readings:

1. C.R.Rao : Linear Statistical Inference and its Applications

2. V.K.Rohatgi : An Introduction to Probability and Statistics.