Stat-411 Statistical Inference II

100 Marks: 03 Credits

Number of Class: 35-40

Point Estimation: Minimum Variance Bound, Minimum Variance Unbiased Estimators, Uniformly Minimum Variance Unbiased Estimators, Ancillary Statistics, Minimal Sufficient Statistics, Concept of Bayesian Methods, Bayesian Approach to Estimation Theory, Prior and Posterior Distribution, Bayes Risk, Bayes Estimation, Posterior Bayes Estimator, Minimax Estimator, Admissible Estimator, Bhattacharyya Inequality, MRE Estimator, Shrinkage Estimator, James-Stein Estimator.

Interval Estimation: Confidence Intervals for Parameters of Binomial, Poisson, Normal Distribution and Exponential Distribution, Large Sample Confidence Interval, Bayesian Interval Estimation, Neyman Classical Confidence Intervals.

Hypothesis Test: Neyman-Pearson Lemma, Most powerful test, Uniformly Most Powerful Test, Uniformly Most Powerful Unbiased Test, Locally Uniformly Most Powerful Unbiased Test, Optimal Tests in Different Situations, Randomized Tests, Consistent Tests, Unbiased Tests, Similar Region.

Likelihood Ratio Test, Distribution of LR Statistic, Asymptotic distribution of LR Statistic, LR test in linear model, Generalized Likelihood Ratio Tests, Monotone Likelihood Ratio Test, LM Test and Wald Test.

Sequential Analysis, SPRT, Efficiency of SPRT, Fundamental Identity of Sequential Analysis, OC and ASN Function.

Bayesian Test of Hypothesis, Test of hypothesis concerning normal and exponential distribution in predictive approach. Bayesian treatment of linear model. Bayesian approach to contingency tables.

Text

1. Mood, A. M. and Graybill, F. A. and Boes, D.C. (1974): *Introduction to the Theory of Statistics*, 3rd edition, McGraw-Hill, New York.
2. *Cassela, G. and Berger, R. L. (2001): Statistical Inference, Wadsworth Publishing Company, California.*

3. Kendall, M. and Stuart, A. (1979): *The Advanced Theory of Statistics*, Volume 2, 4th edition, Macmillan Publishing Inc., New York.

References

1. Hogg, R.V. and Craig, A. T (2009)*: Introduction to Mathematical Statistics,* 6th edition, Pearson Education, Singapore.
2. Kendall, M.G. and Stuart, A. (2004): *Advanced Theory of Statistics*, 14th edition, Edward Arnold, New York.
3. Lindley, D.V (1965): *Introduction to Probability and Statistics*, Part-II.C.U.P, London.
4. Rao, C. R. (1984): *Linear Statistical Inference and its Applications*, 2nd edition, Wiley, New York.
5. Rohatgi, V. K. (1993): *An Introduction to Probability Theory and Mathematical Statistics*, Wiley Eastern.
6. Rohatgi, V.K., Saleh, A.K. Md. E., (2001): *An Introduction to Probability and Statistics*, John Wiley and Sons, New York.
7. Saxena, N.C. and Surendra, P.N*. Statistical Inference.*
8. Yule, G.U. and Kendall, M.G. (1999)*: An Introduction to the Theory of Statistics,* Universal Book Stall, New Delhi.