3rd Year 1st Semester

Stat-311 Statistical Inference I

100 Marks: 03 Credits

Number of Class: 35-40

Point Estimation: Principle of Point Estimation, Method of Finding Estimators, Maximum Likelihood Estimation, Method of Moments, Method of Minimum χ^2, Method of Least Squares, Method of Minimum Distance, Properties of Estimator, Closeness, Mean Squared Error, Unbiasedness, Consistency, Efficiency, Pitman Closer, Pitman Closest Estimator, Loss Function, Risk Function, Minimax Estimator, Admissible Estimator, Sufficiency, Fisher's Consistency, Correction for Bias, Consistent Asymptotically Normal (CAN) Estimators, Best Asymptotically Normal (BAN) Estimators, Cramer-Rao Lower Bound, Completeness, Rao-Blackwell Theorem, Lehman-Scheffe Theorem.

Interval Estimation: Concept of Confidence Interval, Method of Finding Confidence Intervals: Pivotal Quantity Method and Statistical Method, Confidence Interval for Mean, Variance.

Hypothesis Test: Basic Ideas and Preliminary Definition, Simple hypothesis, Composite Hypothesis, Critical region, Best Critical Region, Two-sided BCR, Steps of Hypothesis Testing, *p*-value, Test of Mean, Variance, Proportion, Correlation, Regression Coeffiients, Test of Homogeneity in Parallel Samples.

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. Allen, S. and J. Keith (1986): *Advanced Theory and Mathematical Statistics*, Vol. II, Charles Griffin, London.
2. Bickel, P.J. and K.A. Doksum (1977): *Mathematical Statistics, Holden-Day*, New Jersey.
3. Brunk S.D. (1978): *An Introduction to Mathematical Statistics*, 3rd edition, Collier Macmillan, New York.
4. Hogg, R.V. and Craig, A. T (2009)*: Introduction to Mathematical Statistics,* 6th edition, Pearson Education, Singapore.
5. Kendall, M.G. and Stuart, A. (2004): *Advanced Theory of Statistics*, 14th edition, Edward Arnold, New York.
6. Lehmann, E.L. and G. Cassela (1998): *Theory of Point estimation*, Springer Verlag, New York.
7. Lindley, D.V (1965): *Introduction to Probability and Statistics*, Part-II.C.U.P, London.
8. Rao, C. R. (1984): *Linear Statistical Inference and its Applications*, 2nd edition, Wiley, New York.
9. Rohatgi, V. K. (1993): *An Introduction to Probability Theory and Mathematical Statistics*, Wiley Eastern.
10. Rohatgi, V.K., Saleh, A.K. Md. E., (2001): *An Introduction to Probability and Statistics*, John Wiley and Sons, New York.
11. Saxena, N.C. and Surendra, P.N. *Statistical Inference.*
12. Yule, G.U. and Kendall, M.G. (1999)*: An Introduction to the Theory of Statistics,* Universal Book Stall, New Delhi.