Semester-VIII

Module Code:	STAT-407 STAT-408
Module Title:	• Statistical Inference-II (Theory) – 3 Credit Hours • Practical – 1 Credit Hour
Name of Scheme:	BS Statistics

Course Outline

Method of moments. Maximum likelihood method and its properties. Method of least squares and its properties. Ordered least squares estimation of location and scale parameters. Minimum chi-square method.

Interval estimation. Confidence interval and its interpretation. One-sided confidence intervals. Methods of finding confidence intervals. Pivotal quantity method. Confidence intervals for the mean and variance. Confidence region for the mean and variance. Large-sample confidence intervals. Bayesian interval estimates. Shortest sets of confidence intervals.

Tests of Hypotheses. Simple and composite hypotheses. Power function. Size and power of a test. Randomized and Non-randomized tests. Most powerful tests. Neyman-Pearson lemma. Loss function and Risk function. Bayes test. Generalized likelihood-ratio tests. Uniformly most powerful tests, unbiased test. Monotone likelihood ratio tests of hypotheses. Sequential probability ratio test. Approximate sequential probability ratio test. Average sample number.

Books Recommended

1. Hogg, R.V., & Craig, A.T. (1995). *Introduction to mathematical statistics* (5th ed.). MacMillan: New York.
2. Mood, A.M., Graybill, F.A., & Boes, D.C. (1974). *Introduction to the theory of statistics* (3rd ed.). McGraw-Hill: New York.
3. Levy, P.S., & Lemeshow, S. (2008). *Sampling of populations: Methods and applications* (4th ed.). John Wiley: New York.
4. Lehmann, E.L., & Casella, G. (1998). *Theory of point estimation* (2nd ed.). Springer: New York.
5. Rao, C.R. (2001). *Linear statistical inference and its applications* (2nd ed.). John Wiley: New York.
6. Hoel, P.G. (1984). *Introduction to mathematical statistics* (5th ed.). John Wiley: New York.

Reference Books

1. Hogg, R.V., & Tanis, E.A. (2005). *Probability and statistical inference* (7th ed.). Prentice Hall: New Jersey.
2. Lindgren, B.W. (1993). *Statistical theory* (4th ed.). Chapman and Hall: New York.
3. Kendall, M., Stuart, A., & Ord, J.K. (1991). *Kendall's advanced theory of statistics, Vol. 2: Classical Inference and relationship* (5th ed.). Oxford University Press: New York.
4. Spanos, A. (1999). *Probability theory and statistical inference*. Cambridge University Press: UK.
5. Welsh, A.H. (1996). *Aspects of statistical inference* (1st ed.). John Wiley: New York.
6. Miller, I., & Miller, M. (1998). *John E. Freund's mathematical statistics* (6th ed.). Prentice Hall: New Jersey.
7. Kale, B.K. (2005). *A first course on parametric inference* (2nd ed.). Narosa: New Dehli.