Department of Mathematics & Computing
Session: 2021-2022 (winter semester)

Course Type	Course Code	Name of Course	L	T	P	Credit
DC	MCC509	Statistical Inference	3	0	0	9

Course Objective
Statistical Inference is one of the fundamental course which requires in higher studies for anyone who intends to practices statistical tools and methodologies for data analysis. Keeping these points in view, the course structure of statistical inference has been finalized.
Learning Outcomes
After completion of this course, students will be equipped with the knowledge of estimation techniques for population parameters and different statistical tests required in data analysis.

Sl. No	Topics	No. of Lectures	Learning Outcome
1.	Estimation: Criteria of a good estimator, related theorems and results, uniformly minimum variance unbiased estimation, Cramer Rao inequality, Rao-Blackwell theorem.	12	Introduces the features of good estimators and provides the idea and applications of important theorems useful in statistical inference.
2.	Methods of estimation: method of maximum likelihood, method of moments, method of least squares; Interval Estimation	6	Introduces different methods to find good estimators.
3.	Test of Hypothesis: Definition of various terms, NeymanPearson's Lemma, Likelihood ratio test. Tests for mean and variance in normal distribution (one and two population case), tests for correlation co-efficient and regression coefficient, pair t-test, Chi-square test for goodness of fit, contingency table, Large sample tests through normal approximations, test of independence of attributes.	12	Provides the concept of hypothesis testing and introduces various tests required in data analysis.
4.	Sequential analysis, Non-parametric tests for non-normal population: run test, sign test, Mann-Whitney Wilcoxon Utest.	4	Gives the concepts of sequential analysis where sample size is a random variable and also introduces the non-parametric tests applicable where normality assumption does not holds good.
5.	Analysis of variance: One-way and Two-ways with their applications.	5	Give the idea about analyzing the variations creep in the data due to various factors.

Text Books

1. Lehmann, E.L and Casella G., Theory of Point Estimation, 2nd Ed, Springer, 1998. 2. Lehmann, E.L and Joseph P. Romano, Testing Statistical Hypotheses, 3rd Ed, Springer, 2005.

Reference Books

1. Gupta S.C. and Kapoor,V. K., Fundamentals of Mathematical Statistics, Sultan Chand and Sons. 2. Mood M., Graybill F.A. and Boes D.C. Introduction to the Theory of Statistics, Tata McGrawHill, New Delhi. 3. Gupta S.C. and Kapoor,V. K., Fundamentals of Applied Statistics, Sultan Chand and Sons.

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Professor