INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
भारतीय प्रौद्योगिकी संस्थान तिरुपति

1.	Title of the course	Statistical Inference
2.	Course number	MA508L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To MA5115/7
6.	To be offered by	Department of Mathematics and Statistics
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** To introduce the fundamental concepts and techniques of statistical inference including point estimation, interval estimation and testing of hypothesis. To study different methods of estimating unknown parameters and their properties. To learn different methods for testing of hypotheses. To implement the methodologies to the simulated and real data	
10.	**Course Content:** Methods of estimations, Method of Maximum Likelihood Estimation(MLE), Method of Moments Estimation(MOME), Properties of estimators, unbiasedness-basic concepts, consistency, efficiency, uniformly minimum variance unbiased estimator, sufficiency, Neyman Fisher factorization criterion, ancillary statistic, completeness, Rao-Blackwell theorem and its implications, Lehmann- Scheffe's theorem and its importance, Cramer-Rao lower bound, information inequality for multi-parameter case-information matrix, Bhattacharya system of lower bounds, confidence intervals,basic concepts in statistical hypotheses testing-simple and composite hypothesis, critical regions, type-I and type-II errors, size and power of a test, Neyman-Pearson lemma and its applications, most powerful test, uniformly most powerful test, unbiased test and uniformly most unbiased test,likelihood ratio test.	
11.	**Textbook(s):** 1. Cassela G, *Berger R L, Statistical Inference*, Wadsworth and Brooks (1990).	
12.	**Reference(s):** 1. Lehmann E L, *Testing Statistical Hypotheses*, Wiley (1986). 2. Lehmann E L, *Theory of Point Estimation*, Wiley (1983).	