Semester	**FOUR**
Course	**Major**
Paper Code	**C2ST230421T**
Paper Title	**Statistical Inference - I**
No. of Credits	**4**
Theory/Composite/ Practical	**Theory**
Minimum No. of preparatory hours per week a student has to devote	**4**
Number of Modules	**One**
Syllabus	***Unit 1:*** ***Introduction:*** Types of Inference. Estimation and Testing of hypothesis. Point Estimation and Interval Estimation. Concepts of parameter and statistic**.** [4] ***Point Estimation*****:** Estimator, mean square error – unbiasedness and minimum variance. Estimation by method of moments. [8] ***Testing of hypothesis*****:** Simple and composite hypotheses, null and alternative hypotheses, level of significance and size of a test, probabilities of Type I and Type II errors, critical region, p-value. [8] ***Unit 2:*** ***Interval Estimation*****:** Length of confidence intervals and confidence coefficient. Pivotal technique of finding confidence intervals. Confidence intervals for mean and variance of a univariate normal distribution. Confidence intervals for difference of means and ratio of variances of two independent normal distributions & a bivariate normal distribution. Confidence intervals for correlation and regression coefficients. [8] ***Unit 3:*** ***Tests of significance related to normal distribution:*** Tests for mean and variance of a univariate normal distribution. Tests related to means and variances of two independent normal distributions. Tests related to means and variances of bivariate normal distribution. Test related to correlation coefficient (null case) of a bivariate normal distribution. Tests related to regression coefficients. [16] ***Tests of significance related to discrete distributions*****:** Test related to single Binomial proportion and Poisson mean. Test related to equality of binomial proportions and Poisson means. [8]
Learning Outcomes	○ To understand the basics of parametric inference. ○ To learn the concept of point estimation.

<table>
<tr><td></td><td colspan="2">o To learn the basics of Testing of Hypotheses.
o To apply tests of significance related to univariate and bivariate normal distributions.
o To apply tests of significance related to discrete distributions.
o To understand interval estimation.
o To find confidence intervals of parameters from univariate and bivariate normal distributions.</td></tr>
<tr><td>Reading/Reference List</td><td colspan="2">1. Goon, A.M. Gupta, M.K. and Dasgupta, B. (2003): An outline of Statistical Theory, Vol. 1, 4th Edn.World Press, Kolkata.
2. Goon, A.M. Gupta, M.K. and Dasgupta, B. (2003): Fundamental of Statistics, Vol. 1, 4th Edn.World Press, Kolkata
3. Rohatgi V.K. and Saleh, A. K. Md , E. (2009): An Introduction to Probability and Statistics, 2nd edition (Reprint), John Wiley and Sons.
4. Hogg, R.V. and Tanis, E.A. (2009): A Brief Course in Mathematical Statistics. Pearson Education.
5. Johnson, R.A. and Bhattacharya, G.K. (2001): Introduction to the theory of Statistics, 3rd edition (Reprint). Tata McGraw-Hill Pub. Co. Ltd.
6. Casella, G. & Berger, R.L. (2021): Statistical Inference. Cengage Learning.</td></tr>
<tr><td>Evaluation</td><td colspan="2">CIA: 30
End-Sem: 70
Total: 100</td></tr>
<tr><td rowspan="2">Paper Structure for End Semester</td><td>Short questions (5 marks each)</td><td>Long questions (15 marks each)</td></tr>
<tr><td>5 out of 7</td><td>3 out of 5</td></tr>
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