ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATANAM
III SEMESTER   **STATISTICS**   TIME: 5HRS/WEEK
ST 3202(3)   **STATISTICAL INFERENCE**   MAX.MARKS:100
 w.e.f.:2020-2021(20AH) admitted batch   **SYLLABUS**

OBJECTIVES:

- This paper deals with standard sampling distributions like Chi Square, t and F and their characteristics and applications.

- This paper deals with the different techniques of point estimation for estimating the parameter values of population and interval estimation for population parameters.

- In this paper, various topics of Inferential Statistics such as interval estimation, Testing of Hypothesis, large sample tests (Z-test), small sample tests (t-test, F-test, chi-square test) and non-parametric tests are dealt with. These techniques play an important role in many fields like pharmaceutical, agricultural, medical etc.

COURSE LEARNING OUTCOMES : The students will acquire

- Concept of law large numbers and their uses

- Concept of central limit theorem and its uses in statistics

- concept of random sample from a distribution, sampling distribution of a statistic, standard error of important estimates such as mean and proportions,

- knowledge about important inferential aspects such as point estimation, test of hypotheses and associated concepts,

- knowledge about inferences from Binomial, Poisson and Normal distributions as illustrations,

- concept about non-parametric method and some important non-parametric tests.

COUSRE : UNIT-I : CONCEPTS: Population, Sample, Parameter, statistic, Sampling distribution, Standard error. Convergence in probability and convergence in distribution, law of large numbers, and central limit theorem (statements only). Student's t- distribution, F – Distribution, χ^2-Distribution: Definitions, properties and their applications.

UNIT-II : THEORY OF ESTIMATION: Estimation of a parameter, criteria of a good estimator – unbiasedness, consistency, efficiency, &sufficiency and. Statement of Neyman's factorization theorem. Estimation of parameters by the method of moments and maximum likelihood (M.L), properties of MLE's. Binomial, Poisson &Normal Population parameters estimate by MLE method. Confidence Intervals.

UNIT-III : TESTING OF HYPOTHESIS: Concepts of statistical hypotheses, null and alternative hypothesis, critical region, two types of errors, level of significance and power of a test. One and two tailed tests. Neyman-Pearson's lemma. Examples in case of Binomial, Poisson, Exponential and Normal distributions.

UNIT – IV : LARGE SAMPLE TESTS: Large sample test for single mean and difference of two means, confidence intervals for mean(s). Large sample test for single proportion, difference of proportions. Standard_deviation and correlation coefficient(s).

SMALLSAMPLETESTS:T-testforsinglemean,differenceofmeansandpairedt-test.$\square$2-testforgoodness of fit and independence of attributes. F-test for equality of variances.

UNIT – V : NON-PARAMETRIC TESTS: Their advantages and disadvantages, comparison with parametric tests. Measurement scale- nominal, ordinal, interval and ratio. One sample runs test, sign test and Wilcoxon-signed rank tests (single and paired samples). Two independent sample tests: Median test, Wilcoxon –Mann-Whitney U test, Wald Wolfowitz's runs test.

TEXT BOOKS :

1. BA/BSc II year statistics - statistical methods and inference – Telugu Academy by A.Mohanrao, N.Srinivasa Rao, Dr R.Sudhakar Reddy, Dr T.C. RavichandraKumar.
2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC.PHI.

REFERENCE BOOKS:

1. Fundamentals of Mathematics statistics: VK Kapoor and SCGuptha.
2. Outlines of statistics, Vol II: Goon Guptha, M.K.Guptha, Das GupthaB.
3. Introduction to Mathematical Statistics: HoelP.G.
4. Hogg Tanis Rao: Probability and Statistical Inference. 7[th]edition. Pearson.

** ** **