CODE: BSC-DS-401
SUBJECT NAME: STATISTICS-II
CREDITS: 3

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SESSIONAL:	25			3	0	0
THEORY EXAM:	75					
TOTAL:	100					

Course Objectives
1. Probability distributions and their expectation.
2. Estimation of population parameters using sample statistics and draw appropriate conclusions from the analysis.
3. Null and alternative hypothesis
4. Regression Analysis and models

Course Contents:
UNIT I
Standard probability distributions: Binomial, Poisson, geometric, negative binomial, hypergeometric, uniform, normal, exponential, Cauchy, beta and gamma along with their properties and limiting / approximation cases.
UNIT II
Concept of population and sample, complete enumeration versus sampling, sampling and non-sampling errors. Types of sampling: non-probability and probability sampling, basic principle of sample survey, simple random sampling with and without replacement, definition and procedure of selecting a sample, estimates of: population mean, total and proportion, variances of these estimates, estimates of their variances and sample size determination.
UNIT III
Methods of Estimation: Method of moments, method of maximum likelihood estimation, method of minimum Chi-square, basic idea of Bayes estimators.
UNIT IV
Principles of test of significance: Null and alternative hypotheses (simple and composite), Type-I and Type-II errors, critical region, level of significance, size and power, best critical region, most powerful test, uniformly most powerful test.
UNIT V
Regression analysis: Simple regression analysis, Estimation and hypothesis testing in case of simple and multiple regression models, Concept of model matrix and its use in estimation. Analysis of variance: Definitions of fixed, random and mixed effect models, analysis of variance and covariance in one-way and two way classified data for fixed effect models.

Course Outcomes

1. Concept of random variables and its probability distributions.
2. Sampling Techniques
3. Basic concepts of hypothesis testing, including framing of null and alternative hypothesis.