

Devi Ahilya University, Indore, India Institute of Engineering & Technology				III Year B.E. (Information Technology (Full Time))				
Subject Code & Name		Instruction Hours per Week			Credits			
5ITRG3 Applied Statistics		L	T	P	L	T	P	Total
Duration of Theory Paper: 3 Hours		3	1	0	3	1	0	4

Course Objectives:

The course is designed to develop understanding of –

1. the use of applied statistical methods for analytical and objective basis for decisions.
2. the concept of statistical inference in daily life and engineering applications.

Course Outcomes:

Students earned credits will develop ability to—

- CO1 use applied statistical methods for analytical and objective basis for decisions.
- CO2 use the common probability distributions that are used in statistical inference.
- CO3 test the hypothesis that the value of a population parameter equals a certain value.
- CO4 estimate the value of statistical inference, and use data to draw conclusions.
- CO5 identify the situations where One way and Two-way ANOVA is applicable.
- CO6 use statistics in computer science for a number of things, including data mining, data compression, speech recognition, vision & image analysis, artificial intelligence and network & traffic modeling.

CO-PO Relationship:

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO1	3	3	3	2	1	-	-	-	-	-	-	-
CO2	2	3	3	2	3	-	-	-	-	-	-	-
CO3	3	2	3	3	3	-	-	-	-	-	-	-
CO4	3	1	2	3	3	-	-	-	-	-	-	-
CO5	2	3	2	2	2	-	-	-	-	-	-	-
CO6	3	2	2	3	3	-	-	-	-	-	-	-

Prerequisite:

Elementary statistics, matrices and determinants, probability.

COURSE CONTENTS

UNIT-I

Correlation and regression analysis – linear correlation and regression, regression plane, multiple and partial correlation. Random variables-discrete and continuous random variables, cumulative distribution function. Normal distribution.

UNIT-II

Elements of Hypothesis Testing : Null and Alternative hypotheses, Simple and Composite hypotheses, Critical Region, type I and type II Errors, Level of significance and size, p-value. Test of significance of large and small samples. Test of goodness of fit and independence of attributes.

UNIT-III

Design of experiments: Principle of experimental design, complete randomized block design, randomised block design, ANOVA: one-factor and two factor classifications.

UNIT-IV

Stochastic processes; classification, special stochastic processes-Poisson process, Markov process, discrete-time Markov chains (MCs): Chapman-Kolmogorov equations, n-step transition probabilities, classification of states and limiting probabilities, continuous-time Markov chains (MCs): birth-death processes.

UNIT-V

Queuing Theory: Objectives and characteristics of a Queuing System, classification of Queuing models, probability distribution of arrival and service times, Models (M/M/1, M/M/C, M/E κ /1, M/D/1, D/D/1). Reliability: Basic Concepts, Evaluation of system reliability.

Books Recommended:

- [1].T. Veerarajan, Probability, Statistics and Random Processes, Tata McGraw - Hill Education, 2002.
- [2].K. S. Trivedi, Probability and Statistics with Reliability, Queuing, and Computer Science Applications, John Wiley & Sons, 2006.
- [3].Freund John E, Mathematical Statistics, PHI, N.D., 7th Ed., 2010.
- [4].S.C.Gupta, Fundamentals of Statistics, Himalaya Publishing House, Mumbai, 6th Ed., 2009.