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

Learning Objectives:

- To enable the students to 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.

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$_K$/1, M/D/1, D/D/1).Reliability: Basic Concepts, Evaluation of system reliability.

Learning Outcomes:

Upon completing the course, students will be able to:

1. Use statistics for a specialist study of applications areas like developing speech recognition software, quality management, software engineering, storage and retrieval processes and software and hardware engineering and manufacturing.

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.