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**			
ITR5G3	**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:

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