PROBABILITY , STATISTICS AND QUEUING THEORY

B.Tech. II Year II - Semester
(IT)
[R-15 Regulation]

Credits	Periods			Exam Hrs.	Sessional Marks	Exam Marks	Total Marks
	Theory	Tutorial	Lab				
4	3	1	-	3	40	60	100

Course Objective:

The knowledge of Mathematics is necessary for a better understanding of almost all the Engineering and Science subjects. Here our intention is to make the students acquainted with the concept of basic topics from Mathematics, which they need to pursue their engineering degree in different disciplines.

Course Outcomes: At the end of the course, the student will be able to:

1	Understand the concepts of various statistical measures like mean , variance and standard deviation of a random variable.
2	Familiarize the different types probability distributions and their properties.
3	Compute simple correlation between the variables and fit straight line , parabola by the principle of least squares.
4	Analyze the statistical data and apply various small or large sample test for testing the hypothesis.
5	Learn about different Queuing models and its applications.

CO – PO Mapping :

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO-1	**3**	**2**										**1**
CO-2	**3**	**2**										**1**
CO-3	**3**	**2**										**1**
CO-4	**3**	**2**										**1**
CO-5	**3**	**2**										**1**

SYLLABUS

UNIT – I: PROBABILITY & MATHEMATICAL EXPECTATIONS

(12 Periods)

Introduction to probability: Definition of random experiment – Events and sample space – Definition of probability – Addition and multiplication theorems – Conditional probability – Baye's theorem – Simple problems on Baye's theorem.

Random variables: Discrete and continuous random variables – Distribution function of random variable – Properties, probability mass function – Probability density function – Mathematical expectation – Properties of mathematical expectations – Mean and variance.

UNIT – II: PROBABILITY DISTRIBUTION **(14 Periods)**

Discrete distributions: Binomial distribution – Mean and standard deviations of Binomial distribution – Poisson distribution – Mean and standard deviations of Poisson distribution – Applications. **Continuous probability distributions**: Uniform distribution – Exponential distribution – Normal distribution – Properties of Normal distribution – Importance of Normal distribution – Area properties of Normal curve.

UNIT – III : CURVE FITTING , CORRELATION AND REGRESSION

(10 Periods)

Curve Fitting : Principle of least squares – Method of least squares (Straight Line and Parabola) .

Correlation : Definition – Measures of correlation – Correlation for Bivariate distribution – Rank correlation coefficients.

Regression : Simple linear regression – Regression lines and properties.

UNIT – IV : TESTING OF HYPOTHESIS **(14 Periods)**

Formulation of Null Hypothesis – Critical region – Level of significance.

Small Samples : Students t - distribution (Significance test of a sample mean, Significance test of difference between sample means) – F- distribution – χ^2 - test – Goodness of fit.

Large samples : Test of Significance of large samples – Single proportion – Difference between two proportions – Single mean and difference of means.

UNIT – V : QUEUEING THEORY **(10 Periods)**

Queue description – Characteristics of a queuing model – Study state solutions of M/M/1: α Model and M/M/1 ; N Model.

TEXT BOOK :

1. **T. Veerarajan**. "*Probability, Statistics and Random Processes",* Tata McGraw Hill Publications.

REFERENCE BOOKS:

1. **Kishor S. Trivedi, "***Probability & Statistics with Reliability, Queuing and Computer Applications",* Prentice Hall of India ,1999.