19HS203 PROBABILITY AND STATISTICS

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Hours Per Week :

L	T	P	C
3	1	-	4

Total Hours :

L	T	P
45	15	-

WA/RA	SSH/HSH	CS	SA	S	BS
20	45	-	10	-	5

COURSE DESCRIPTION AND OBJECTIVES:

To provide students with foundation in elementary topics of statistics and probability such as descriptive statistics, correlation, regression, probability, random variables, distributions, test of hypothesis required for various engineering applications.

COURSE OUTCOMES:

Upon completion of the course, the student will be able to achieve the following outcomes.

COs	Course Outcomes	POs
1	Determine values of various descriptive measures.	2
2	Learning the concept of curve fitting process and apply it in correlation and regression.	2
3	Appreciate the use of concept of probability in real life situations.	2
4	Apply various probability distributions and their properties to a given situation.	2
5	Analyse a given hypothesis for acceptance or rejection.	3

SKILLS:

- ✓ *Analyse the data using measures of central tendency.*
- ✓ *Fit an appropriate curve for a given set of data.*
- ✓ *Test the statistical data for rejection or acceptance.*

UNIT - I **L-9, T-3**

DESCRIPTIVE STATISTICS: Basic definitions, Frequencies, Graphical representation, Histogram, Ogive curves; Measures of central tendency, Arithmetic mean, Median, Mode, Mean deviation, Standard deviation; Symmetry and skewness, Karl pearson's coefficient of skewness.

UNIT - II **L-9, T-3**

CURVE FITTING, CORRELATION, REGRESSION: Least squares method, Curve fitting (straight line, parabola, exponential curve only).
Covariance; Correlation, Types, Pearson's coefficient of correlation, Rank correlation, Spearman's rank correlation; Regression, Regression lines.

UNIT - III **L-9, T-3**

PROBABILITY: Introduction, Definition (Classical and Axiomatic approach), Addition theorem, Conditional probability, Multiplication theorem, Total probability, Bayes theorem.

UNIT - IV **L-9, T-3**

RANDOM VARIABLES, DISTRIBUTIONS: Random variables, Discrete and Continuous variables, Introduction to distributions.
Binomial distribution: Definition, Mean and standard deviation, Recurrence relation, Applications, Fitting of binomial distribution.
Poisson Distribution: Definition, Mean and Standard deviation, Recurrence relation, Poisson distribution is an approximation of binomial distribution, Applications, Fitting of poisson distribution.
Normal Distribution: Definition, Normal curve, Mean and Standard deviation, Median, Mode, Normal distribution applications.

UNIT - V **L-9, T-3**

TEST OF HYPOTHESIS: Population and sampling, Parameters and statistics, Types of sampling. Test of hypothesis : Null hypothesis, Errors, Level of significance, Confidence limits, Testing large samples, one mean, two means, one proportion, two proportions.
Test of significance : t-distribution for small sample, difference between means of small sample, Chi square test for goodness of fit, Chi square test for testing of independence of attribites.

TEXT BOOKS:

1. H K Dass and Er. Rajanish Verma, "Higher Engineering Mathematics", 3rd edition, S. Chand & Co., 2015.
2. S. C. Gupta and V. K. Kapoor, "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, 2012.

REFERENCE BOOKS:

1. P. R. Vittal, "Mathematical Statistics", Margham Publications, Chennai, 2018.
2. Kishore S. Trivedi, "Probability and Statistics with Realiability, Queueing and Computer Science Applications", 2nd edition, Wiley Student edition, 2008.
3. A. Singaravelu, "Probability and Statistics", 22nd edition, Meenakshi Agency, 2015.