

SMTA1402	PROBABILITY AND STATISTICS (COMMON TO CSE AND IT)	L	T	P	Credits	Total Marks
		3	*	0	3	100

COURSE OBJECTIVES

- The ability to identify, reflect upon, evaluate and apply different types of information and knowledge to form independent judgments. Analytical, logical thinking and conclusions based on quantitative information will be the main objective of learning this subject.

UNIT 1 PROBABILITY CONCEPTS AND RANDOM VARIABLE**9 Hrs.**

Probability Space – Events – Axiomatic approach to Probability – Conditional Probability – Independent Events – Baye's Theorem – Random Variables – Functions of Random Variables and their Probability Distribution.

UNIT 2 PROBABILITY DISTRIBUTION**9 Hrs.**

Discrete Distributions: Binomial, Poisson and Geometric – Continuous Distributions: Uniform, Exponential and Normal – Applications only (no derivation).

UNIT 3 TWO DIMENSIONAL RANDOM VARIABLES**9 Hrs.**

Joint Probability distributions – Marginal and Conditional Distributions – Transformation of Random Variables.

UNIT 4 CORRELATION AND REGRESSION**9 Hrs.**

Correlation – Linear regression – Multiple and Partial Correlation – Curve Fitting – Method of Least Squares – Fitting of the Curve of the form $y = a+bx$, $y = a+bx+cx^2$, $z = ax+by+c$.

UNIT 5 ANALYSIS OF VARIANCE AND STATISTICAL QUALITY CONTROL**9 Hrs.**

Review of F-test – Design of experiments: Completely Randomized Design, Randomized Block Design and Latin Square Design – Statistical Quality Control: Mean, Range, p, np, c – charts.

Max. 45 Hrs.**COURSE OUTCOMES**

On completion of the course, student will be able to

- CO1 - Define probabilities, probability distributions. List the discrete and continuous distributions.
- CO2 - Explain functions of random variables and their probability distributions. Explain and derive the parameters of the distributions.
- CO3 - Choose appropriate probability theorem and solve the problems. Prepare the cumulative distribution for random variables. Application of the parameters of distributions. Sketch the control charts and point out the results based on the charts.
- CO4 - Distinguish correlation and regression. Categorize the regression coefficients.
- CO5 - Evaluate the constants involved in curves by the method of least squares. Evaluate the correlation coefficients. Compare the variances of design of experiments.
- CO6 - Construct and develop the transformations of random variables. Also determine their mean and variances by expectations.

TEXT / REFERENCE BOOKS

- Hong R.V, Tanis E.A and Zimmerman D L, Probability and Statistical Inference, Pearson Education Limited, 9th Edition, 2015.
- Miller I. and Freund J.E, Probability and Statistics for Engineers, Pearson Publishers, 9th Edition, 2017.
- Gupta S C and Kapoor V K, Fundamentals of Mathematical Statistics, Sultan Chand and Sons, 10th Edition, 2002.
- Veerarajan T., Probability, Statistics and Random Processes, Tata McGraw-Hill, New Delhi, 4th Edition, 2014.
- Sivaramakrishna Das P., Vijaya Kumari C., Probability and Random Processes, Pearson Education, 6th Edition 2014.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max. Marks : 100****PART A : 10 Questions of 2 marks each-No choice****PART B : 2 Questions from each unit with internal choice, each carrying 16 marks****Exam Duration : 3 Hrs.****20 Marks****80 Marks**