

<b>21MAT06</b>	<b>PROBABILITY AND STATISTICS</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>
<b>COURSE OBJECTIVES:</b>					
<ul style="list-style-type: none"> <li>• This course aims at providing the required skill to apply the statistical tools in engineering problems.</li> <li>• To introduce the basic concepts of probability and random variables.</li> <li>• To introduce the basic concepts of two dimensional random variables.</li> <li>• To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems?</li> <li>• To introduce the basic concepts of classifications of design of experiments, this plays very important roles in the field of agriculture and statistical quality control.</li> </ul>					
<b>UNIT I</b>	<b>PROBABILITY</b>	<b>12 Hours</b>			
Definitions of Probability - Conditional Probability - Baye's Rule - Random variable - Probability mass function and Density function - Binomial Distribution - Poisson Distribution- Normal Distribution - Moment Generating Function.					
<b>UNIT II</b>	<b>TWO DIMENSIONAL RANDOM VARIABLES</b>	<b>12 Hours</b>			
Joint Probability Density Function - Marginal and Conditional Distributios - Transformation of Random Variable - Covariance and Conditional Expectation - Correlation Coefficient.					
<b>UNIT III</b>	<b>TESTING OF HYPOTHESIS</b>	<b>12 Hours</b>			
Sampling distributions - Statistical hypothesis - Large sample tests based on Normal distribution for single mean and difference of means - Tests based on t, Chi-square and F distributions for mean, variance and proportion - Contingency table (test for independent) - Goodness of fit.					
<b>UNIT IV</b>	<b>DESIGN OF EXPERIMENTS</b>	<b>12 Hours</b>			
One way and Two way classifications - Completely randomized design - Randomized block design - Latin square design.					
<b>UNIT V</b>	<b>STATISTICAL QUALITY CONTROL</b>	<b>12 Hours</b>			
Control charts for measurements (X and R charts) - Control charts for attributes (p, c and np charts) - Tolerance limits - Acceptance sampling.					
<b>UNIT VI</b>	<b>CASE STUDY</b>				
Case Study on application of PROBABILITY AND STATISTICS					

### **Course Outcomes:**

- Upon completion of this course, the students will be able to:
- Find the probability of an event and the moment generating function of Binomial, Poisson and Normal
- Distributions Determine marginal and conditional probability distributions and correlation of two dimensional random
- Apply the concept of testing of hypothesis for small and large samples in real life problems.
- Apply the basic concepts of classifications of design of experiments in the field of agriculture and statistical quality control.

### **Text books:**

1. Sheldon M. Ross, S.M., "Introduction to Probability and Statistics for Engineers & Scientists", Academic press, 2009.
2. Johnson, R.A., Miller, I and Freund J., & ;Miller and Freund's Probability and Statistics for Engineers" Pearson Education, Asia, 8th Edition, 2015..

### **Reference Books:**

1. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8th Edition, 2014.
2. Papoulis, A. and Unnikrishnapillai, S., "Probability, Random Variables and Stochastic Processes", McGraw Hill Education India, 4th Edition, New Delhi, 2010.