

## PROBABILITY AND STATISTICS

II B. TECH- I SEMESTER								
Course Code:	Category	Hours / Week			Credits	Maximum Marks		
A4BS05	BSC	L	T	P	C	CIE	SEE	Total
		2	1	-	3	30	70	100
<p><b>COURSE OBJECTIVES:</b> To learn</p> <ol style="list-style-type: none"> <li>1. The concepts of discrete and continuous random variables, the probability distribution and density function.</li> <li>2. Evaluation of marginal and conditional distribution of multiple random variables.</li> <li>3. The concept of correlation and regression to find covariance.</li> <li>4. Evaluation of the given data for appropriate test of hypothesis.</li> <li>5. Analyzing the data for variance.</li> </ol> <p><b>COURSE OUTCOMES:</b> After learning the contents of this paper the student must be able to</p> <ol style="list-style-type: none"> <li>1. Describe the continuous random variables and moments of Discrete and continuous random variables.</li> <li>2. Calculate probabilities and derive the marginal and conditional distribution of bivariate random variables.</li> <li>3. Apply the concept of correlation and regression to find covariance.</li> <li>4. Evaluate the given data for appropriate test of hypothesis.</li> <li>5. Test the data for analysis of variance.</li> </ol>								
<b>UNIT-I</b>	<b>SINGLE RANDOM VARIABLES</b>						<b>Classes: 08</b>	
Basic definitions of probability- Random Variables – Discrete and Continuous. Probability distributions, mass function/ density function of a probability distribution, mathematical expectation, moments about origin, central moments, skewness, Kurtosis. Moment generating function of probability distribution.								
<b>UNIT-II</b>	<b>PROBABILITY DISTRIBUTIONS</b>						<b>Classes: 08</b>	
Binomial, Poisson, Normal, exponential and Gamma distributions -their Properties. Moment generating functions of the above distributions and hence find the mean and variance. Joint probability distributions- Joint probability mass /density function, Marginal probability, mass / density functions.								
<b>UNIT-III</b>	<b>CORRELATION &amp; REGRESSIONSAMPLING DISTRIBUTIONS</b>						<b>Classes:10</b>	
Coefficient of correlation, the rank correlation, Covariance of two random variables. Regression- Regression Coefficient, The lines of regression and multiple correlation & regression								
<p><b>Sampling:</b> Definitions of population, sampling, statistic, parameter. Types of sampling, Expected values of Sample mean and variance, sampling distribution, Standard error, Sampling distribution of means and sampling distribution of variance.</p> <p>Parameter estimation- Point estimation and interval estimation</p>								
<b>UNIT-IV</b>	<b>TESTING OF HYPOTHESIS - I</b>						<b>Classes: 10</b>	
<p><b>Testing of hypothesis:</b> Null hypothesis, Alternate hypothesis, Type I&amp; Type II errors – critical region, confidence interval, and Level of significance. One sided test, Two sided test.</p> <p><b>Large sample tests:</b></p> <p>(i) Test of Equality of means of two samples, equality of sample mean and population mean (cases of</p>								

known variance & unknown variance, equal and unequal variances)		
(ii) Tests of significance of difference between sample S.D and population S.D.		
(iii) Tests of significance difference between sample proportion and population proportion, difference Between two sample proportions.		
<b>UNIT-V</b>	<b>TESTING OF HYPOTHESIS-II</b>	<b>Classes:06</b>
Student t-distribution, its properties; Test of significance sample mean and population mean, difference between means of two small samples. Snedecor's F- distribution and its properties. Test of equality of two population variances. Chi-square distribution, its properties, Chi-square test of goodness of fit.		
<b>TEXT BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. B.S.Grewal, Higher Engineering Mathematics, Khanna publishers, 36th Edition, 2010.</li> <li>2. Probability and Statistics for Engineers by Richard Arnold Johnson, Irwin Miller and John E. Freund, New Delhi, Prentice Hall</li> <li>3. Probability and Statistics for Engineers and Sciences by Jay L. Devore, Cengage Learning</li> </ol>		
<b>REFERENCE BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. Ervin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley &amp; Sons, 2006.</li> <li>2. Fundamentals of Mathematical Statistics by S.C. Gupta &amp; V.K. Kapoor, S. Chand</li> <li>3. Introduction to Probability and Statistics for Engineers and Scientists by Sheldon M. Ross, Academic Press</li> </ol>		
<b>WEB REFERENCES:</b>		
<ol style="list-style-type: none"> <li>1. <a href="https://www.efunda.com/math/math_home/math.cfm">https://www.efunda.com/math/math_home/math.cfm</a></li> <li>2. <a href="https://www.ocw.mit.edu/resources/#Mathematics">https://www.ocw.mit.edu/resources/#Mathematics</a></li> <li>3. <a href="https://www.sosmath.com/">https://www.sosmath.com/</a></li> <li>4. <a href="https://www.mathworld.wolfram.com/">https://www.mathworld.wolfram.com/</a></li> </ol>		
<b>E -TEXT BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. <a href="https://www.e-booksdirectory.com/details.php?ebook=10166https://">https://www.e-booksdirectory.com/details.php?ebook=10166https://</a></li> <li>2. <a href="http://www.e-booksdirectory.com/details.php?ebook=10166">www.e-booksdirectory.com/details.php?ebook=10166</a></li> </ol>		
<b>MOOCS COURSE:</b>		
<ol style="list-style-type: none"> <li>1. <a href="https://swayam.gov.in/">https://swayam.gov.in/</a></li> <li>2. <a href="https://onlinecourses.nptel.ac.in/">https://onlinecourses.nptel.ac.in/</a></li> </ol>		