



**BAPATLA ENGINEERING COLLEGE:: BAPATLA**  
(Autonomous)

<b>PROBABILITY AND STATISTICS</b>															
<b>II B.Tech III Semester 18MA003 (ME)</b>															
Lectures	:	4 Periods/Week		Credits - 3		Continuous Assessment	:	50							
Final Exam	:	3 hours				Final Exam Marks	:	50							
<b>Pre-Requisite:</b> None															
<b>Course Objectives:</b> Students will learn how to															
➤	Apply the continuous probability densities to various problems in science and engineering.														
➤	Estimate the point and interval estimators of the mean, variance and proportion for the given Sample data and apply Z-test, t-test to various real-life problems.														
➤	Apply various sample tests like F-test and $\chi^2$ -test for decision making regarding the population based on sample data.														
➤	Compute the level of correlation, the best fit curve to the given data by the method of least squares and also perform ANOVA arising in the field of engineering.														
<b>Course Outcomes:</b> At the end of the course, the students will be able to															
CO-1	Understand various continuous probability density functions and apply them to various problems in science and engineering.														
CO-2	Estimate the point and interval estimators of the mean, variance and proportion for the given Sample data and apply Z-test and t-test to various real life problems.														
CO-3	Apply various sample tests like F-test and $\chi^2$ -test for decision making regarding the population based on sample data and perform one way and two way analysis of variance to different realistic problems.														
CO-4	Compute the level of correlation, the linear relationship for the given bivariate data, the best fit curve to the given data by the method of least squares and perform multiple regression analysis to the regression model arising in the field of engineering.														
<b>Mapping of Course Outcomes with Program Outcomes &amp; Program Specific Outcomes</b>															
	<b>PO's</b>												<b>PSO's</b>		
<b>CO's</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>CO-1</b>	3	3	-	-	-	-	-	-	-	-	-	2	2	-	-
<b>CO-2</b>	3	3	2	-	-	-	-	-	-	-	-	2	2	-	-
<b>CO-3</b>	3	3	2	-	-	-	-	-	-	-	-	2	2	-	-
<b>CO-4</b>	3	3	3	-	-	-	-	-	-	-	-	2	3	-	-
<b>UNIT-1</b>													(12 Hours)		
Continuous Random Variables, Normal Distribution, Normal Approximation to the Binomial Distribution, Uniform Distribution, Gamma Distribution and its applications, Beta Distribution and its applications, Joint Distributions (Discrete), Joint Distributions (Continuous). Populations															



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distribution of the mean ( $\sigma$ unknown), The sampling distribution of the variance. (Sections 5.1, 5.2, 5.3, 5.5, 5.7, 5.8, 5.10, 6.1, 6.2, 6.3, 6.4 of Text Book [1])	
<b>UNIT-2</b>	
(12 Hours)	
Point estimation, Interval estimation, Tests of Hypotheses, Null Hypothesis and Tests of hypotheses, Hypothesis concerning one mean, Comparisons-Two independent Large samples, Comparisons-Two independent small samples, Paired sample t test. (Sections 7.1, 7.2, 7.4, 7.5, 7.6, 8.2, 8.3, 8.4 of Text Book [1])	
<b>UNIT-3</b>	
(12 Hours)	
The estimation of variances, Hypotheses concerning one variance, Hypotheses concerning two variances, Estimation of proportions, Hypotheses concerning one proportion, Hypotheses concerning several proportions, Procedure for Analysis of Variance (ANOVA) for comparing the means of k ( $>2$ ) groups- one way classification (Completely randomized designs), Procedure for Analysis of Variance (ANOVA) for comparing the means of k ( $>2$ ) groups- two way classification (Randomized block designs). (Sections 9.1, 9.2, 9.3, 10.1, 10.2, 10.3, 12.2, 12.3 of Text Book [1]).	
<b>UNIT-4</b>	
(12 Hours)	
<b>Multivariate Analysis:</b> The concept of bivariate relationship, scatter diagram, Pearson's correlation and correlation matrix. Simple linear regression model and assumptions, Least Squares Estimation of the parameters of the model, Testing the significance of the model. Regression versus Correlation, Multiple linear regression model with k explanatory variables and assumptions of the model. Least Square Estimation of regression coefficients. Concept of the coefficient of determination $R^2$ . Test for significance of the regression model and individual regression coefficients. Applications of multiple regression analysis. (1 <sup>st</sup> and 2 <sup>nd</sup> Chapters of Text Book [2]).	
Textbooks	<ol style="list-style-type: none"> <li>1. Miller &amp; Freund's "Probability and Statistics for Engineers", Richard A. Johnson, 8<sup>th</sup> Edition, PHI.</li> <li>2. Introduction to Linear Regression Analysis, Douglas C. Montgomery, E.A. Peck and G.G. Vining, 3<sup>rd</sup> edition, Wiley.</li> </ol>
Reference Books	<ol style="list-style-type: none"> <li>1. R.E Walpole, R.H. Myers &amp; S.L. Myers 'Probability &amp; Statistics for Engineers and Scientists', 6<sup>th</sup> Edition, PHI.</li> <li>2. Fundamentals of Mathematical Statistics, S.C.Gupta and V.K.Kapoor, 11<sup>th</sup> Edition, Sultan Chand &amp; Sons.</li> <li>3. Murray R Spiegel, John J.Schiller, R. AluSrinivasa, 'Probability &amp; Statistics', Schaum's outline series.</li> <li>4. K.V.S.Sarma, 'Statistics Made Simple – Do it yourself on PC', Prentice Hall India, Second Edition, 2015.</li> </ol>