SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of Applied Mathematics		LP: MA18185
		Rev. No: 00
M.E : Computer Science & Engineering	Regulation: 2018	Date: 28/12/2020
Sub. Code / Sub. Name : MA18185 / Applied Probability and Statistics		
Unit : I ONE DIMENSIONAL RANDOM VARIABLES		

Unit Syllabus: ONE DIMENSIONAL RANDOM VARIABLES
Random variables - Probability function – Moments – Moment generating functions and their properties – Binomial, Poisson, Geometric, Uniform, Exponential, Gamma and Normal distributions – Functions of a Random Variable

Objective: To introduce the basic concepts of one dimensional random variables.

Session No *	Topics to be covered	Ref	Teaching Aids
1	Introduction to the syllabus and the Unit I	Ref 1, Ref 2, Ref 4	LCD/BB
2	Introduction, Random variables, discrete and continuous random variables, cumulative distribution function	Ref 4 -5.1,5.6,5.13	LCD/BB
3	Probability mass/density function Moments, moment generating function, probability generating function.	Ref 4 - 5.6,5.13,6.1,6.3,6.67,6.123	LCD/BB
4	Moments, moment generating function, probability generating function	Ref 4 -6.1,6.3,6.67,6.123	LCD/BB
5,6	Examples of discrete random variables- Binomial Poisson variates . Poisson Distribution	Ref 4 -7.1-7.15,7.40-47	LCD/BB
7,8	Poisson, Geometric distributions.	Ref 4 -7.40-7.47,7.83-85	LCD/BB
9,10	Continuous distributions - Uniform, Exponential distributions.	Ref 4 -8.1-8.2,8.85-8.89	LCD/BB
11	Gamma distribution, Normal distribution	Ref 4 -8.68-8.70,8.17-8.26	LCD/BB
12	Normal Distribution	Ref 4 -8.17-8.26	LCD/BB
13	Function of Random Variable – discrete, continuous	Ref 4 -5.70	LCD/BB
14	Function of Random Variable, Revision	Ref 4 -5.70	LCD/BB

Content beyond syllabus covered (if any): Basic probability theory.

* Session duration: 50 minutes

SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY   Page 2 of 6

Sub. Code / Sub. Name: MA18185: **APPLIED PROBABILITY AND STATISTICS**
Unit : II

Unit Syllabus: TWO DIMENSIONAL RANDOM VARIABLES

Joint distributions – Marginal and Conditional distributions – Functions of two dimensional random variables – Regression Curve – Correlation

Objective: To introduce the basic concepts of two dimensional random variables.

Session No *	Topics to be covered	Ref	Teaching Aids
15	Two- dimensional random variables, Joint distribution functions, joint density functions.	Ref 4 -5.41,5.42	LCD/BB
16	Marginal distribution/density functions, conditional density functions, independent random variables	Ref 4 -5.43,5.47	LCD/BB
17	Problems	Ref 4 -5.43,5.47	LCD/BB
18	Problems	Ref 4 -5.43,5.47	LCD/BB
	CAT		
19	Covariance, Correlation	Ref 4 -10.1-32,10.61-75	LCD/BB
20	Regression lines	Ref 4 -10.49-57	LCD/BB
21	Regression lines	Ref 4 -10.49-57	LCD/BB
22	Regression curves	Ref 4 -10.39-43	LCD/BB
23	Regression curves	Ref 4 -10.39-43	LCD/BB
24	Transformation of random variables	Ref 4 -5.73	LCD/BB
25	Transformation of random variables, Revision	Ref 4 -5.73	LCD/BB

Content beyond syllabus covered (if any): Basic Integration and Applications of Probability theory.

* Session duration: 50 minutes

Sub. Code / Sub. Name: **MA18185: APPLIED PROBABILITY AND STATISTICS**
Unit : III

Unit Syllabus: ESTIMATION THEORY

Unbiased Estimators – Method of Moments – Maximum Likelihood Estimation - Curve fitting by Principle of least squares – Regression Lines

Objective: To provide information about estimation theory, correlation and regression

Session No *	Topics to be covered	Ref	Teaching Aids
26	Introduction to the Unit, Unbiased Estimators	Ref 4 -15.1,2	LCD/BB
27	Unbiased Estimators, Properties	Ref 4 -15.1,2,52,	LCD/BB
28	Method of Moments , Problems	Ref 4 -15.69-72	LCD/BB
29	Problems	Ref 4 -15.69-72	LCD/BB
30	Problems	Ref 4 -15.69-72	LCD/BB
31	Maximum Likelihood Estimation, Problems	Ref 4 -15.52-68	LCD/BB
32	Problems	Ref 4 -15.52-68	LCD/BB
33	Curve fitting by the method of least squares, Fitting curves of the form ax+b,ax2+bx+c	Ref 4 -9.1,9.2	LCD/BB
34	Fitting curves of the form ax+b,ax2+bx+c, ab^x and ax^b	Ref 4 -9.1-9.3	LCD/BB
35	Problems	Ref 4 -9.1,9.2,9.3	LCD/BB
	CAT		

Content beyond syllabus covered (if any): Characteristics of estimator.

* Session duration: 50 minutes

SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Sub. Code / Sub. Name: MA18185: **APPLIED PROBABILITY AND STATISTICS**

Unit : IV

Unit Syllabus: TESTING OF HYPOTHESES

Sampling distributions - Type I and Type II errors - Tests based on Normal, t,2 and F distributions for testing of mean, variance and proportions – Tests for Independence of attributes and Goodness of fit.

Objective: To provide information about Testing of Hypothesis.

Session No *	Topics to be covered	Ref	Teaching Aids
36	Introduction to the Unit	Ref 4 -12.1-4	LCD/BB
37	Concept of sampling, Methods of sampling, Sampling distributions and Standard Error	Ref 4 -12.3,4	LCD/BB
38	Test of hypothesis-Type I, Type II Errors, Critical region	Ref 4 -12.7	LCD/BB
39	Small samples and large samples , Problems	Ref 4 -12.10	LCD/BB
40	Problems	Ref 4 -14.1-5	LCD/BB
41	Large sample tests for difference of mean and proportions	Ref 4 -12.15-37	LCD/BB
42	Problems	Ref 4 -12.15-37	LCD/BB
43	Test based on normal , t2, F distribution	Ref 4 -14.15-24	LCD/BB
44	Problems	Ref 4 -14.15-24	LCD/BB
45	Problems	Ref 4 -14.15-24	LCD/BB
46	Test for Independence, Test of goodness of fit.	Ref 4 -13.1-39	LCD/BB
47	Problems	Ref 4 -13.49	LCD/BB
48	Problems	Ref 4 -13.49	LCD/BB

Content beyond syllabus covered (if any):Errors of testing hypothesis

* Session duration: 50 minutes

Sub. Code / Sub. Name: MA18185: **APPLIED PROBABILITY AND STATISTICS**

Unit : V

Unit Syllabus: **MULTIVARIATE ANALYSIS**

Random Vectors and Matrices - Mean vectors and Covariance matrices - Multivariate Normal density and its properties - Principal components Population principal components - Principal components from standardized variables

Objective: To enable the students to use the concepts of multivariate normal distribution and principle components analysis.

Session No *	Topics to be covered	Ref	Teaching Aids
49	Introduction to the Unit, Random Vectors and Matrices	Ref 3-1to13,49,50,66,67	LCD/BB
50	Mean vectors and Covariance matrices	Ref 3-66-78	LCD/BB
51	Problems	Ref 3-103-107	LCD/BB
52	Problems	Ref 3-103-107	LCD/BB
53	Multivariate Normal density and its properties	Ref 3-149-153	LCD/BB
54	Problems	Ref 3-156-163	LCD/BB
55	Problems	Ref 3-200-203	LCD/BB
56	Principal components Population principal components	Ref 3-430-434	LCD/BB
57	Problems	Ref 3-434-439	LCD/BB
58	Principal components from standardized variables	Ref 3-440	LCD/BB
59	Problems	Ref 3-200-205	LCD/BB
60	Revision		LCD/BB
	CAT III		

Content beyond syllabus covered (if any): Eigen value and Eigen vector concepts. Applications of Principal Component Analysis
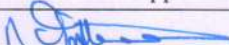
* Session duration: 50 minutes

Sub. Code / Sub. Name: MA18185: **APPLIED PROBABILITY AND STATISTICS**

REFERENCES:

1 Jay L. Devore, "Probability and Statistics For Engineering and the Sciences",Thomson and Duxbury, 2002.
2. Richard Johnson. "Miller & Freund's Probability and Statistics for Engineer", Prentice – Hall , Seventh edition, 2007.
3. Richard A. Johnson and Dean W. Wichern, "Applied Multivariate Statistical Analysis", Pearson Education, Asia, Fifth Edition, 2002.
4. Gupta S.C. and Kapoor V.K."Fundamentals of Mathematical Statistics", Sultan an Sons, 2001.
5. Dallas E Johnson , "Applied Multivariate Methods for Data Analysis", Thomson and Duxbury press,1998.

	Prepared by	Approved by
Signature		
Name	Dr. B Thilaka	Dr. R. Muthucumaraswamy
Designation	Professor	Professor and Head
Date	28/12/2020	28/12/2020
Remarks *:		
Remarks *:		