

MOHAMMED SATHAK A J COLLEGE OF ENGINEERING

Siruseri IT park, OMR, Chennai - 603103

LESSON PLAN						
Department of <u>INFORMATION TECHNOLOGY</u>						
Name of the Subject	PROBABILITY AND STATISTICS	Name of the handling Faculty	S.SUDHA			
Subject Code	MA8391	Year / Sem	II/IV			
Acad Year	2020-2021	Batch	2019-2023			
Course Objective						
This course aims at providing the required skill to apply the statistical tools in engineering problems.						
To introduce the basic concepts of probability and random variables.						
To introduce the basic concepts of two dimensional random variables.						
To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems.						
To understand the significance of advanced queueing models..						
Course Outcome						
Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.						
Understand the basic concepts of one and two dimensional random variables and apply in engineering applications.						
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.						
Have the notion of sampling distributions and statistical techniques used in engineering and management problems.						
Lesson Plan						
Sl. No.	Topic(s)	T / R* Periods Book Required	Mode of Teaching (BB / PPT / NPTEL / MOOC / etc)	Blooms Level (L1-L6)	CO	PO
UNIT I PROBABILITY AND RANDOM VARIABLES						
1	Introduction to Random variables.	T1	1	PPT/BB	L1,L2	CO1 PO1,PO3
2	Probability – Axioms of probability	T1	1	PPT/BB	L2,L4	CO1 PO1,PO3
3	Conditional probability	T1	1	PPT/BB	L1,L4	CO1 PO1,PO3
4	Predicates and quantifiers	T1	1	PPT/BB	L1,L2	CO1 PO1,PO3
5	Baye’s theorem	T1	1	PPT/BB	L1,L2	CO1 PO1,PO3

6	Discrete random variables-Problems	T1	1	PPT/BB	L1,L2	CO1	PO1,PO3
7	Continuous random variables-Problems	T1	1	PPT/BB	L2,L4	CO1	PO1,PO3
8	Moments	T1	1	PPT/BB	L1	CO1	PO1,PO3
9	Binomial Distribution.	T1	1	PPT/BB	L1,L2	CO1	PO1,PO3
10	Poisson Distribution.	R1	1	PPT/BB	L3	CO1	PO1,PO3
11	Geometric Distribution & Uniform Distribution.	R1	1	PPT/BB	L3	CO1	PO1,PO3
12	Exponential Distribution & Normal distribution	R1	1	PPT/BB	L3	CO1	PO1,PO3

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any

Evaluation method :Assignment -1 given compare these topics with real time applications

UNIT II		DIMENSIONAL RANDOM VARIABLES					
13	Introduction - Joint distributions.	T1	1	PPT/BB	L1,L2	CO2	PO1,PO2, PO3
14	Marginal distributions.	T1	1	PPT/BB	L2,L4	CO2	PO1,PO2, PO3
15	Conditional distributions.	T1	1	PPT/BB	L2	CO2	PO1,PO2, PO3
16	Covariance.	T1	1	PPT/BB	L1,L2,L4	CO2	PO1,PO2, PO3
17	Properties, Problems on Correlation	T1	1	PPT/BB	L1,L2,L4	CO2	PO1,PO2, PO3
18	Regression – properties.	T1	1	PPT/BB	L1,L4	CO2	PO1,PO2, PO3
19	Problems on regression.	T1	1	PPT/BB	L2,L4	CO2	PO1,PO2, PO3
20	Problems on Transformation of random variables	T1	1	PPT/BB	L1	CO2	PO1,PO2, PO3
21	Central Limit Theorem	T1	1	PPT/BB	L1,L2,L4	CO2	PO1,PO2, PO3
22	Problems based on the Central limit theorem.	R2	1	PPT/BB	L3	CO2	PO1,PO2, PO3
23	Tutorial	R2	1	PPT/BB	L3	CO2	PO1,PO2, PO3
24	Tutorial	R2	1	PPT/BB	L3	CO2	PO1,PO2, PO3

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any

Evaluation method :Assignment -2 given compare these topics with real time applications							
UNIT III TESTING OF HYPOTHESIS							
25	Sampling distributions	T1	1	PPT/BB	L1	CO3	PO1,PO2
26	Estimation of parameters	T1	1	PPT/BB	L1,L4	CO3	PO1,PO2
27	Statistical hypothesis	T1	1	PPT/BB	L1	CO3	PO1,PO2
28	Large sample tests based on Normal distribution for single mean and difference of means	T1	1	PPT/BB	L1,L2	CO3	PO1,PO2
29	Tests based on t	T1	1	PPT/BB	L2,L4	CO3	PO1,PO2
30	Chi-square and F distributions for mean.	T1	1	PPT/BB	L2,L4	CO3	PO1,PO2
31	Chi-square and F distributions for Variance	T1	1	PPT/BB	L2,L4	CO3	PO1,PO2
32	Chi-square and F distributions for propotion	T1	1	PPT/BB	L2,L4	CO3	PO1,PO2
33	Contingency table	R1	1	PPT/BB	L1	CO3	PO1,PO2
34	Goodness of fit.	R1	1	PPT/BB	L3	CO3	PO1,PO2
35	Tutorial	R1	1	PPT/BB	L3	CO3	PO1,PO2
36	Tutorial	R1	1	PPT/BB	L3	CO3	PO1,PO2
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any							
Evaluation method :Assignment -3 given compare these topics with real time applications							
UNIT IV DESIGN OF EXPERIMENTS							
37	One way classifications	T1	1	PPT/BB	L1,L2	CO4	PO1
38	One way classifications	T1	1	PPT/BB	L1,L2,L4	CO4	PO1
39	Two way classifications	T1	1	PPT/BB	L1,L4	CO4	PO1
40	Two way classifications	T1	1	PPT/BB	L1,L4	CO4	PO1
41	Completely randomized design	T1	1	PPT/BB	L1,L2	CO4	PO1

42	Completely randomized design	T1	1	PPT/BB	L1,L2	CO4	PO1
43	Randomized block design	T1	1	PPT/BB	L1,L2	CO4	PO1
44	Randomized block design	T1	1	PPT/BB	L1,L2,L4	CO4	PO1
45	Latin square design	T1	1	PPT/BB	L1,L2	CO4	PO1
46	2 ² factorial design	R2	1	PPT/BB	L3	CO4	PO1
47	Tutorial	R2	1	PPT/BB	L3	CO4	PO1
48	Tutorial	R2	1	PPT/BB	L3	CO4	PO1

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Evaluation method :Assignment -4 given compare these topics with real time applications

UNIT V ADVANCED QUEUEING MODELS

49	Introduction-Finite source models	T1	1	PPT/BB	L1,L2	CO5	PO1,PO3
50	M/G/1 queue	T1	1	PPT/BB	L1,L2,L4	CO5	PO1,PO3
51	Pollaczek- Khintchine formula	T1	1	PPT/BB	L1,L4	CO5	PO1,PO3
52	Pollaczek- Khintchine formula-Problems	T1	1	PPT/BB	L2,L4	CO5	PO1,PO3
53	Problems on M/G/1 queue	T1	1	PPT/BB	L1,L4	CO5	PO1,PO3
54	M/D/1 and M/EK/1 as special cases	T1	1	PPT/BB	L1,L4	CO5	PO1,PO3
55		T1	1	PPT/BB	L1,L2,L4	CO5	PO1,PO3
56	Series queues-Problems	T1	1	PPT/BB	L1,L4	CO5	PO1,PO3
57	Open Jackson networks	T1	1	PPT/BB	L1,L4	CO5	PO1,PO3
58	Open Jackson networks -Problemes	R1	1	PPT/BB	L3	CO5	PO1,PO3
59	Tutorial	R1	1	PPT/BB	L3	CO5	PO1,PO3
60	Tutorial	R1	1	PPT/BB	L3	CO5	PO1,PO3

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others
Planned if any

Evaluation method :Assignment -5 given compare these topics with real time applications

Content Beyond the Syllabus Planned										
1	Go to nearest village collect the required data frame the problem use F-distribution and solve it.									
2										
Text Books										
1	Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 8th Edition, 2015.									
2	Milton. J. S. and Arnold. J.C., "Introduction to Probability and Statistics", Tata McGraw Hill, 4th Edition, 2007.									
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.									
3	Ross, S.M., "Introduction to Probability and Statistics for Engineers and Scientists", 3rd Edition, Elsevier, 2004									
4	Spiegel. M.R., Schiller. J. and Srinivasan, R.A., "Schaum's Outline of Theory and Problems of Probability and Statistics", Tata McGraw Hill Edition, 2004.									
5	Walpole. R.E., Myers. R.H., Myers. S.L. and Ye. K., "Probability and Statistics for Engineers and Scientists", Pearson Education, Asia, 8th Edition, 2007.									
Website / URL References										
1	https://onlinecourses.nptel.ac.in									
2										
3										
Blooms Level										
Level 1 (L1) : Remembering		Lower Order Thinki ng	Fixed Hour Exams	Level 4 (L4) : Analysing				Higher Order Thinki ng	Projects / Mini Projects	
Level 2 (L2) : Understanding				Level 5 (L5) : Evaluating						
Level 3 (L3) : Applying				Level 6 (L6) : Creating						
Mapping syllabus with Bloom's Taxonomy LOT and HOT										
Unit No	Unit Name		L1	L3	L4	L5	L6	LOT	HOT	Total
Unit 1	PROBABILITY AND RANDOM VARIABLES		7	3	3	0	0	20	0	20
Unit 2	DIMENSIONAL RANDOM VARIABLES		6	3	6	0	0	22	0	22
Unit 3	TESTING OF HYPOTHESIS		5	3	4	0	0	17	0	17
Unit 4	DESIGN OF EXPERIMENTS		9	3	4	0	0	23	0	23
Unit 5	ADVANCED QUEUEING MODELS		8	3	8	0	0	23	0	23
Total			35	15	25	0	0	105	0	105

Total Percentage						33.333	14.29	23.81	0	0	100	0	100
CO PO Mapping													
	PO1	PO2	PO3	PO4	PO5	PO6	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	1	-	-	-	-	-	-	-	-	2	-
CO2	2	1	1	-	-	-	-	-	-	-	-	2	-
CO3	3	2	-	-	-	-	-	-	-	-	-	2	-
CO4	3	-	-	-	-	-	-	-	-	-	-	2	-
CO5	3	-	2	-	-	-	-	-	-	-	-	2	-
Avg	3	2	2	-	-	-	-	-	-	-	-	2	-
Justification for CO-PO mapping													
CO1	Discuss the fundamental probability concepts and random variables.												
CO2	Relate the concepts of Standard distributions which can describe real life phenomena.												
CO3	Analyze a highly utilized technique.												
CO4	Develop the experiments by hypothesis & Relate the Concept of Statistical Control System in Real life Situations.												
CO5	Solve the distributions and Statistical Concepts in Real life problems												
3		High level			2		Moderate level			1		Low level	
Name & Sign of Faculty Incharge : S,SUDHA													
Name & Sign of Subject Expert :													
Head of the Department :													

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