University of Kerala

Discipline	Mathematics				
Course Code	UK3DSEMAT203				
Course Title	Probability Theory				
Type of Course	DSE				
Semester	III				
Academic Level	200-299				
Course Details	Credit	Lecture per week	Tutorial per week	Practical	Total Hours per week
	4	4		-	4
Pre-requisites	1. Sets, limit and continuity of functions				
Course Summary	This course provides a comprehensive idea on basic probability theory and some standard distributions				

Detailed Syllabus

Module	Unit	Contents	Hrs
I	**Introduction to probability**		**9**
	1	Basic terminology	
	2	Probability	
	Chapter 3: Sections 3.3, 3.4, 3.5, 3.8 of Text [1]		
II	**Random variables and distribution functions**		**9**
	3	Discrete random variable	
	4	Continuous random variable	
	Chapter 5: Sections 5.1, 5.2, 5.3, 5.4 of Text [1]		
III	**Mathematical Expectation**		**9**
	5	Expected value of a random variable	
	6	Expected value of function of a random variable	
	Chapter 6: Section 6.1, 6.2, 6.3, 6.4, 6.5(only the concept of covariance) of the Text [1].		
IV	**Standard Distributions**		**9**

Module	Unit	Contents	Hrs
	7	Discrete uniform distribution, Bernoulli distribution	
	8	Binomial distribution	
	Chapter 8: Sections 8.1,8.2, 8.3, 8.4 (subsections 8.4.1 to 8.4.8), Section 8.5 (subsections 8.5.2 to 8.5.6) and in Chapter 9: Sections 9.2 (subsections 9.2.1 to 9.2.5), Sections 9.5, 9.6 of the Text [1]?		
V	**Suggestions for teacher designed module**		**9**
	For internal assessment examinations only.		
	9	Axiomatic approach to probability Distribution function Properties of expectation and variance, covariance Poisson distribution Normal, Gamma and Beta distributions	
	These topics can be found in Chapter 3 Sections 3.8, Chapter 5 Section 5.1?.....		

Text book

Text 1 S C Gupta and V K Kapoor, *Fundamentals of Mathematical statistics*, 4th Edition, Sultan Chand and Sons, 2005.

References

Ref. 1 R J Larsen and M L Marx, An introduction to Mathematical Statistics and its Applications, 6th edition, Pearson, 2011.

Ref. 2 V K Rohatgi and A K Md Ehsanes Saleh, An Introduction to Probability and Statistics, 2nd edition, John-Wiley, 2001.

Ref. 3 Sheldon Ross, A first course in probability, 5th Edn, Prentice Hall, 1998.

e-resources

1. https://www.sagemath.org/help.html

Course Outcomes

CO No.	Upon completion of the course the graduate will be able to	PO/PSO	Cognitive Level	Knowledge Category	Lecture(L) Tutorial (T)	Practical (P)
CO 1	Understand the different approaches to probability and their properties	PSO 1, 2	U	F, C	L, T	As
CO 2	Develop the idea of random variables, distribution functions and their expectations	PSO2, 3	U,Ap	C, P	L, T	As
CO 3	Create a concrete idea of some standard distributions	PSO2, 3	Ap, An	C, P	L, T	As
CO 4	Apply the knowledge to solve real world problems	PSO4, 5, 6	C	M	L, T	As

(R-Remember, U-Understand, Ap-Apply, An-Analyse, E-Evaluate, C-Create)
(F-Factual, C-Conceptual, P-Procedural, M-Metacognitive)

Mapping of CO with PSOs and POs

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	-	-	-	-	2	-	1	-	-	-	-	-
CO2	-	2	2	-	-	-	2	-	2	-	-	-	-	-
CO3	-	2	2	-	-	-	-	2	-	-	-	-	-	-
CO4	-	-	-	2	2	2	-	2	-	-	2	2	-	-

(- -Nill, 1-Slightly/Low, 2-Moderate/Medium, 3-Substantial/High)

Assessment Rubrics

- Quiz/Assignment/Discussion/Seminar
- Midterm Exam
- Programming Assignments
- Final Exam

Mapping of COs to Assessment Rubrics

	Internal Examination	Assignment	Project Evaluation	End Semester Exam
CO1	✓			✓
CO2	✓	✓		✓
CO3	✓			✓
CO4	✓	✓		✓