Lecture Plan

Name of the college: Government College of Arts , Science & Commerce, Sanquelim, Goa.

Name of Faculty: Amit Harichandra Thakur	**Subject:** Probability Theory	
Paper code: MAT-221	**Program: S.Y.B.Sc.**	**Division: A**
Academic year: 2024-25	**Semester: IV**	**Total Lectures: 30**

Course Objectives:
1 Understand basic probability concepts and theorems.
2 Analyze random variables and their distributions.
3 Apply mathematical expectations and generating functions.
4 Explore and solve problems using key probability distributions.

Expected Course Outcome:
   The student will be able to,
   1. Apply the knowledge of probability theory in analysing real life situations and case studies.
   2. Model various probability functions.
   3. Illustrate and interpret mathematical expectation.
   4. Solve various problems in probability distributions.

Student Learning Outcome:
   1. Students will be able to apply fundamental probability concepts, analyze random variables, and utilize probability distributions to solve real-world problems in mathematical and statistical contexts

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
December	**Week 1** **04/12/24**	**07/12/24**	0	Nil			S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
December	**Week 2** **09/12/24**	**14/12/24**	02	Probability problems based on addition and multiplication theorems.	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
December	**Week 3** **16/12/24**	**21/12/24**	00 Liberation Day				.
January	**Week 4** **02/01/25**	**04/01/25**	02	Conditional probability and Baye's theorem.	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.

			02	Probability mass functions and probability density functions.	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
January	**Week 5** 06/01/25	11/01/25	02	Probability mass functions and probability density functions.	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
January	**Week 6** 13/01/25	18/01/25	02	Joint probability mass functions, and conditional and marginal probability functions	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
January	**Week 7** 20/01/25	25/01/25	02	Stochastic independence.	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
January-February	**Week 8** 27/01/25	01/02/25	02	Mathematical expectation	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
February	**Week 9** 03/02/25	08/02/25	02	Covariance and moments.	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
February	**Week 10** 10/02/25	15/02/25	02	Moments and moment generating functions.	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals

							of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
February	**Week 11** 17/02/25	**22/02/25**	02	Binomial distribution: Mean and Variance	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
February-March	**Week 12** 24/02/25	**01/03/25**	02	Binomial distribution: Moment Generating Function and Application	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
March	**Week 13** 03/03/25	**08/03/25**	02	Poisson distribution.	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
March	**Week 14** 10/03/25	**15/03/25**	00 Holi				
March	**Week 15** 17/03/25	**22/03/25**	02	Normal distribution	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
March	**Week 16**		02	Revision	Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals

		24/03/25	29/03/25						of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
March-April	**Week 17** 31/03/25	05/04/25	02	Revision		Problem Solving	Chalkboard	S. C. Gupta, and V. K. Kapoor: Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand & Sons, 2020.
April	**Week 18** 7/4/25	11/4/25	03	Practical Exam				

* Assessment Rubrics

Component	Max Marks
ISA 1	7.5
ISA 2	7.5
Practical	25
Project	Nil
Semester End Exam	60