

22MAT203	Probability and Random Variables	L	T	P	S/O	C
Version 1.0		2	1	0	0	3
Pre-requisites/Exposure	12 th Standard Mathematics					
Co-requisites	Basic concepts of probability					

Course Objectives

1. To introduce the theory and practice of data computation.
2. To estimate and analyze the data.
3. To introduce probability distributions and its applications.

Course Learning Outcomes (CLOs)

On completion of this course, the students will be able to

CLO1. Analyze statistical data using Microsoft Excel.

CLO2. Identify an appropriate probability distribution and use its properties to calculate probabilities.

CLO3. Construct a function which closely fits given n-points.

Course Content

Unit – I

12 Lecture Hours

Descriptive Statistics Data collection, types of data, graphical representation of data, descriptive measures for grouped & ungrouped data: mean, median, mode, mean deviation, variance, standard deviations, quartile deviations, central moments, skewness, and kurtosis.

Unit – II

11 Lecture Hours

Basic Probability Basic terminology related to probability, independent events, mutually exclusive and exhaustive events, addition theorem, multiplication theorem, Bayes theorem, Discrete and continuous random variables, probability distributions, and their properties: expectation, variance, MGF, CGF, characteristic function.

Unit – III

11 Lecture Hours

Special Distributions: Discrete Distributions and Fitting - Uniform, Bernoulli, Binomial, Poisson, and Geometric distributions. Continuous Distributions and Fitting - normal, exponential and Gamma distributions .

Unit – IV

11 Lecture Hours

Curve Fitting: Scatter diagram, method of least squares, fitting of a straight line, fitting of second degree and kth degree polynomial, fitting of exponential curve, Conversion of data to linear form, selection of the type of curve to be fitted.

Text Books

1. Gupta, S. C., & Kapoor, V. K. (2020). *Fundamentals of mathematical statistics*. Sultan Chand & Sons.
2. Agarwal, B. L. (2007). *Programmed statistics (question-answers)*. New Age International.
3. P. G. Hoel, S. C. Port and C. J. Stone, *Introduction to Probability Theory*, Universal Book Stall, 2003 (Reprint).

Reference Books

1. S. Ross, *A First Course in Probability*, 6th Ed., Pearson Education India, 2002.
2. W. Feller, *An Introduction to Probability Theory and its Applications*, Vol. 1, 3rd Ed., Wiley, 1968.
3. N.P. Bali and Manish Goyal, *A text book of Engineering Mathematics*, Laxmi Publications, Reprint, 2010.
4. B.S. Grewal, *Higher Engineering Mathematics*, Khanna Publishers, 35th Edition, 2000.
5. Veerarajan T., *Engineering Mathematics (for semester III)*, Tata McGraw-Hill, New Delhi, 2010.

Modes of Evaluation: Assignment/ Quiz / Seminar / Written Examination

Examination Scheme:

Components	Internal	End Semester Examination	Total
Weightage (%)	60%	40%	100%

Relationship between the Course Learning Outcomes (CLOs), Program Learning Outcomes (PLOs), and Program Specific Objectives (PSOs)

Course Learning Outcomes	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3
CLO1															
CLO2															
CLO3															
Avg															

1=weakly mapped

2= moderately mapped

3=strongly mapped