Department of Mathematical and Computational Sciences
National Institute of Technology Karnataka, Surathkal
Course Plan and Evaluation Plan

Course Code	: MA208
Course Title	: Probability Theory and its Applications
Credits (L-T-P)	: 3 (3-0-0)
Course Instructor	: P. Sam Johnson (https://sam.nitk.ac.in/)
Teaching Department	: Mathematical and Computational Sciences (MACS)
Evaluation Plan	: 15% Quiz-1 ; 25% Midsemester
	15% Quiz-2 ; 40% Endsemester ; 5% Assignments

Objective

- Learn the concepts of probability distribution, random variables and their characteristics
- Introduce various well known probability distributions used in data analysis
- Apply the same in the field of science and engineering

Contents

- Introduction to probability, basic terminology, natural frequency approach, definition of probability, finite sample spaces and enumeration procedures, conditional probability, total probability theorem, *Bayes*' theorem.
- One dimensional random variables, types of random variables, two dimensional random variables, marginal and conditional distributions, functions of random variable.
- Characterisation of random variables, expectation and its properties, variance and its properties, moments and its properties, approximate expressions for expectation and variance, Chebyshev's inequality, correlation coefficient, conditional expectation and regression.
- Some important discrete / continuous probability distributions, binomial, Poisson, geometric and Pascal distributions, uniform, normal, exponential and gamma distributions.

References Books :

1. P. L. Meyer, Introductory Probability and Statistical Applications, Oxford & IBH Publishing Co. Pvt Ltd, 1979.
2. S. M. Ross, A First Course in Probability, Pearson Education, Sixth Ed., 2006.
3. S. M. Ross, Introduction to Probability and Statistics for Engineers and Scientists, Academic Press, Fifth Ed., 2014.
4. Murray R. Spiegel, John J. Schiller and R. Alu Srinivasan, Probability and Statistics, Schaum's Outline Series, McGraw-Hill, 2009.

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