

Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NMCD514	Stochastic Processes	3	0	0	3

Course Objective
<ul style="list-style-type: none"> The objective of the course will be to give idea to the students about various Stochastic Processes.
Learning Outcomes
<ul style="list-style-type: none"> This course will be useful for analysis of different financial market data, Business data.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1	Definition and classification of general stochastic processes. Markov Chains: definition, transition probability matrices, classification of states, limiting properties.	10	Understand basics of Stochastics Processes and Markov Chain.
2	Chains with Discrete State Space: Poisson process, birth and death processes. Renewal Process: Renewal Process when Time is discrete, Renewal Process when Time is continues, Renewal Theory and Analysis.	12	Understand different type of Point processes and their applications.
3	Markov Process with Continuous State Space: Introduction to Brownian motion, Wiener Process, Differential equation of Wiener Process, Kolmogorov Equations.	10	Get the concept different continuous State processes with application in finance.
4	Markov Decision Process, BranchingProcess	6	Get the concept of Markov decision process and its applications.
5	Congestion Process: Queuing Process, M/M/1 Queue	4	Understand the concept of Queuing theory and its application.
Total		42	

Text Books:

1. Stochastic Processes by J. Medhi, New Age International Publication
2. Stochastic Processes: An Introduction by Peter W. Jones and Peter Smith, CRC Press

Reference Books:

1. Elements of Applied Stochastic Processes by U.N. Bhat, John Wiley and Sons.
2. Probability and Statistics with Reliability, Queuing, and Computer Science Applications by K.S. Trivedi, Prentice Hall of India.