

## Semester IV

<b>Subject Name: Stochastic Processes</b>	<b>Duration: 6 hrs /Cycle</b>
<b>Subject Code: 4PGM4(2015 on)</b>	<b>Credit : 5</b>
<b>Unit I: Differential Difference Equations:</b> Introduction - Important properties of Laplace transforms – differential equation – differential difference equations – matrix analysis.	
<b>Unit II: Probability Distributions:</b> Generating functions – Laplace transforms – Laplace transform of a probability distribution of a random variable – Classification of distributions.	
<b>Unit III: Stochastic Process:</b> Introduction – Specification of Stochastic Process – Stationary Process – Martingales.	
<b>Unit IV: Markov Chain:</b> Definitions and examples – higher transition probabilities – generalization of independent Bernoulli trials – Classification of states and chains – Determination Higher Transition Probabilities – Stability of Markov System – Graph Theoretic Approach.	
<b>Unit V: Markov Process with Discrete State Space:</b> Poisson Process – Poisson process and Related Distribution – Generalization of Poisson Process – Birth and Death process.	

**Text Book:** Stochastic Processes by J. Medhi, 2<sup>nd</sup> Edition, Reprint 2008, New age international Publisher (1984).

Chapters: 1(sec.1.1 - 1.4), 2(sec. 2.1 - 2.4), 3(sec.3.1 - 3.4), 4(sec. 4.1 - 4.4) and Appendix A (A1-A4).

**Reference Books:** 1. Probability random variable and stochastic processes by A. Papoulis, Tata McGraw – Hill (1991).

2. Stochastic processes by S. K. Srinivasan, K.M. Mehata, 2<sup>nd</sup> Edition, Tata McGraw – Hill (1978).