

**Department of Mathematics**  
**Faculty of Mathematics & Computer Science**  
**M.Sc. (Applied Mathematics), 4<sup>th</sup> Semester**

<b>Course Code</b>	AM 402
<b>Course Title</b>	Applied Stochastic Processes
<b>Course Credits</b>	04

**Course objectives:**

To introduce some basic and advanced stochastic processes which can be applied to real life problems.

**Minimum pre-requisites:**

Probability and Statistics

**Course structure:**

Review of Binomial, Poisson, Exponential and Gamma distributions. Stochastic Processes, Bernoulli Process, Poisson Process, Inter arrival and waiting time distributions, Conditional Distribution of the Arrival Times, Non homogeneous and Compound Poisson Process. Renewal Theory, Wald's Equation, Delayed Renewal Process, Renewal Reward Process, Regenerative Processes and Stationary Point Processes. Markov Chains with applications, Chapman-Kolmogorov Equations, Large Time behaviour and Invariant Probability, Classification of States, Return Times, Transient States and Branching Process. Continuous-Time Markov Chains, Birth and Death Processes. Random Walks with some Applications.

**Reading suggestions:**

- Stochastic Processes by Sheldon M. Ross, Publisher- Wiley Series-1996 (Second Edition)
- Introduction to Stochastic Processes by Gregory F. Lawler, Publisher- Taylor and Francis Group-2006 (Second Edition)
- Introduction to Theory of Statistics by Alexander M. Mood, Franklin A. Graybill and Duane C. Boes.

**Evaluation and weightage:**

- 2 Class Tests (20 marks each).
- Final Semester Examination-60 marks.