

STATISTICS 4402
STOCHASTIC PROCESSES

The main idea in this course is conditional independence of successive steps, called the Markov property. This idea comes up in a number of different problems. The class will spend four or five weeks on a variety of such problems, and on the theory of Markov processes (Ross, chapters 4, 5 and 6).

The most consistently useful application of this material is in the study of how queues fluctuate – for example, how many callers are on ‘hold’ – and of the reliability of systems whose components fail sometimes – such as a rocket on the space shuttle. These applications are part of ‘OR’ – ‘Operations Research’. The course will focus on these topics for about three weeks (Ross, chapters 7, 8 and 9).

One of your goals in this course will be to make judgements on the value of sophisticated mathematical models. A number of these models will be introduced along the way.

Text: *Introduction to Probability Models* by Sheldon Ross or a similar book.

Marks: Varies with the instructor.

Calendar Description: **4402 Stochastic Processes** covers the Poisson process, renewal theory, Markov chains, and some continuous state models including Brownian motion. Applications are considered in queuing, reliability, and inventory theory. Emphasis is on model building and probabilistic reasoning.

Prerequisite: Statistics 3410

NOTE: *Credit cannot be obtained for both MATH 4102 and STAT 4402.*

Offered: *Contact the Deputy Head (Statistics) in the Department of Mathematics and Statistics for information regarding the scheduling of this course.*