

This course provides an introduction to stochastic operations research. It deals with the formulation and solution of some industrial and business problems involving uncertainty. The emphasis is on mathematical models and their applications.

**Textbook:** *Course Notes*

**Prerequisite:** Introductory courses in Probability and Statistics, Calculus and Linear Algebra.

**Exclusion:** Commerce 365\*.

**Instructor:** N. M. Rice

**Evaluation:**

Final Examination	70%
Midterm Test	20%
Homework	10%

**Outline:**

	Lectures
<i>Introduction:</i> Origins of Operations Research.	1
<i>Simulation:</i> Introduction. Monte Carlo methods.	2
<i>Review:</i> Probability laws and distributions.	2
<i>Markov Chains:</i> Introduction to stochastic systems and Markov chains, transition matrices, $n$ -step transition probabilities, steady-state distribution, applications to inventory problems.	8
<i>Queues:</i> Examples of waiting-line problems. Poisson process, Inter-arrival distributions. Exponential distribution. General birth-death process. Simple queuing model. Expected queue length and waiting-time distribution. Multi-server models. Optimal number of servers. Applications to machine maintenance problems.	8
<i>Dynamic Programming:</i> An introduction.	3
Inventory and production planning problems.	4
Pricing Financial Derivatives	6
Midterm and Review	2
	36