CARLETON UNIVERSITY
SCHOOL OF COMPUTER SCIENCE
WINTER 2021

COMP 5005 **LEARNING SYSTEMS FOR RANDOM ENVIRONMENTS**

Instructor: John Oommen
Address: 5372 HP (oommen@scs.carleton.ca)
Phone: 520-2600 (Ext. 4358)

Lecture Hall:	Virtual (ZOOM)	
Lecture Hours:	Monday/Wednesday	14:35 to 15:55 Hours
Office Hours:	Monday/Wednesday	13:00 to 14:00 Hours

Marking Scheme:	Assignments (Four)	40
	Projects (One)	20
	Final Exam	40

Assignments:

1. Assignments must be e-mailed **prior** to the lecture.
2. NO LATE assignments will be accepted.
3. Retain all your assignments for a proof of your mark, just in case your mark is erroneously entered or lost.

Text Book

K. S. Narendra and M. A. L. Thathachar *Learning Automata,* Prentice-Hall, 1989 (or later). You do not need to purchase it. My notes are sufficient. But it is an excellent reference.

Course Contents

Goal: This course will introduce the students to computerized adaptive learning for random environments.

Background: First of all, we will review some mathematical tools such as Markov chains and difference equations.

Material: The heart of the course will involve deterministic and stochastic learning automata with fixed and variable structures. We will study their operation in random environments and the various norms of learning. The learning algorithms studied will be the linear and nonlinear learning schemes of the continuous and discretized families with ergodic and non-ergodic properties.

State of the Art: Recent (up to within the last few months) estimator algorithms will also be examined. We will also discuss machines which can *rank* actions.

Applications: Applications of learning automata in file allocation, game playing, path finding, optimization, solving knapsack problems and in decision making will be discussed.