CARLETON UNIVERSITY
SCHOOL OF COMPUTER SCIENCE
WINTER 2020

COMP 5107
STATISTICAL AND SYNTACTIC PATTERN RECOGNITION

Instructor: John Oommen (www.scs.carleton.ca/~oommen)
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Class Hours: Tuesday/Thursday: 14:35 to 15:55 Hours
Class venue: SA Room 506
Office Hours: Monday/Wednesday: 14:00 to 15:00 Hours

Marking Scheme:

Assignments (4):	60
Project	40

Assignments:

1. Assignments must be handed in **prior** to the lecture.
2. NO LATE assignments will be accepted.
3. Assignments requiring a graphical output **must** be plotted graphically on a computer.
4. You are free to use any computer system or language.
5. Keep all your assignments as a proof - in case your mark is erroneously entered or lost.

Text Book

This year, I will not specify a textbook. My notes should be sufficient.

Reference Books

The classic books on Pattern Recognition by Duda, Hart and Stork, and Fukunaga could be kept in the library reserve if needed.

Course Contents

This course will introduce students to the principles of statistical and syntactic pattern recognition.

After a brief review of the principles of probability, random variables and vectors, we will study Bayes decision theory and criteria for classification. We will then consider the theory of maximum likelihood and Bayesian learning for parametric pattern recognition. After that, we will focus our attention to non-parametric methods such as classification using nearest neighbor rules and discriminant functions. The use of these in Neural Network Classifiers will be highlighted.

The course will also introduce students to various features used in speech, shape and character recognition.

With regard to syntactic pattern recognition we will briefly study the use of distance and probabilistic criteria in classifying strings, substrings, subsequences and trees as used in speech recognition and in matching RNA sequences. If time permits, we will also consider the probabilistic classification of linear and syntactic patterns.