

# **SYDE 372**

## **Introduction to Pattern Recognition**

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## Course Goals

- Course Goals:
  - To introduce the principles of fundamental pattern recognition concepts such as pattern representation, distance measures, probability measures, model learning, etc.
  - To emphasize usefulness of learnt concepts for applications such as optical character recognition, speech recognition, industrial robot vision, medical diagnosis, remote sensing and satellite image analysis, fault detection and diagnosis in complex systems such as nuclear reactors.

## Topics Covered

- Topics Covered:
  - Introduction, Pattern Recognition Problem Definition
  - Overview of Statistics and Random Vectors
  - Parametric and Nonparametric Distance-Based Classification
  - Probabilistic Methods for Classification
  - Parametric and Nonparametric Density Estimation
  - Discriminant Functions
  - Parametric and Nonparametric Clustering
  - Feature Extraction, Feature Selection

# Course Grading

- Grading Scheme:
  - Homework problems: 0%
  - Computer labs: 25%
    - Three computer labs, emphasizing different topics in pattern recognition.
    - Undertaken by students in groups of two or three.
    - Submitted via e-mail to the TAs by midnight of the due date. Late labs will have 25% of the lab mark deducted for each day or part of a day that the lab is late.
  - Midterm: 25%
  - Final exam: 50%

# Course Schedule

- Course Schedule:
  - Class Times:
    - T 11:30–1:20, E5 6006
    - F 11:30–12:20, E5 6006
  - Tutorials:
    - Section 1: F 12:30–1:20, E5 6006, every week
    - Section 2: F 1:30–2:20, E5 6006, every week

## Text Resources

- M. Jernigan and P. Fieguth, “Pattern Recognition in a Nutshell”
  - Available at SCH bookstore
  - Lectures based on text
- On Reserve: Q327.S27 *Pattern Recognition*, R. Schalkoff, Chapters 1–5
- On Reserve: Q327.D83 *Pattern Classification*, Duda, Hart, & Stork, Chapters 1–6
- TK7882.P3.N3 *Pattern Rec. Eng.*, M. Nadler & E. Smith, Chapters 1, 2, 6–8

## Online Resources

- Online Resources

- <http://www.eng.uwaterloo.ca/~a28wong/syde372.html>
- Important updates and news will be posted here

# Cheating and Plagiarism

- Cheating and Plagiarism
  - Both plagiarism and cheating during the course will not be tolerated. Students found cheating or plagiarizing will be given a minimum of zero percent (0%) for the exam or assignment in question.
  - Please refer to Policy 71 on student academic discipline.