

Polytechnic University of Puerto Rico
Department of Electrical Engineering
Master in Electrical Engineering

Course Syllabus

Course Title : Pattern Recognition

Course Code : [EE 6720](#)

Credits : Three (3) Credits

Duration: :One academic quarter

Schedule : Forty-five credit hours per course.

Pre-requisites: [EE 6010](#) Mathematical Methods for Signal Processing.
[EE 6020](#) Stochastic Processes.

Course Description:

The course presents a description of the general pattern recognition problem and the general methods employed for basic pattern recognition applications. Bayes theory is presented as the building block for statistical pattern recognition methods along with the different approaches used for solving real world problems. The techniques presented include both supervised and unsupervised methods and feature selection and reduction techniques.

Justification:

Pattern recognition techniques are used in a variety of applications to automatically classify patterns. Applications in this area include biometrics, speech recognition, image classification and target recognition among others. Additionally, new applications are anticipated in the area of medical imaging and the geological sciences. This course presents the background behind the techniques employed in pattern recognition systems. Students in this course will become familiar with pattern recognition software such as LNKnet and Matlab.

Textbook:

Pattern Classification (2001)
By Duda, Hart and Stork
John Wiley & Sons

Objectives:

Students will become familiar with the following topics in pattern recognition:

1. Description of a general pattern recognition system.
2. Design of pattern recognition classifiers for both supervised and unsupervised problems.
3. Familiarize with pattern recognition software packages such as LNKnet and Matlab.

Topics Covered:

1. Architecture of pattern recognition systems.
2. Bayes theory for pattern recognition.
3. Supervised classification.
4. Unsupervised classification.
5. Feature selection.
6. Feature reduction.

Evaluation Criteria:

Final grade will be determined based on the following scale:

100 – 90	A
89 – 80	B
79 – 79	C
69 – 60	D
59 – 0	F

Course History:

April, 2002; prepared by Pedro A. Torres, Ph.D. Candidate, P.E.

May, 2002; revised by Roman Lopez, Ph.D.

Bibliography:

Machine Learning (1997)

By T.M. Mitchell

McGraw Hill

0070428077

Pattern Recognition and Image Analysis (1996)

By E. Gose, R. Johnsonbaugh and S. Jost

Prentice Hall.
0132364158

Introduction to Statistical Pattern Recognition (1990)
By K. Fukunaga
Academic Press
ISBN: 0122698517