

# ELE888 – Intelligent Systems

- **Course Outline**

<http://www.ee.ryerson.ca/undergraduate/dcd/ele888.html>

- **Key Knowledge to Be Acquired**

Machine learning and pattern classification are fundamental blocks in the design of an intelligent system. This course will introduce fundamentals of machine learning and pattern classification concepts, theories, and algorithms. Topics covered include: Bayesian decision theory, linear discriminant functions, multilayer neural networks, classifier evaluation, and an introduction to unsupervised clustering/grouping, self-organization and evolutionary computation.

- **Key Skills to Be Mastered**

In-depth understanding of various machine learning and pattern classification concepts should allow the student to be able to make informed design choices when dealing with problems requiring decision making based on the data characteristics while accommodating constraints imposed by various practical factors. The course lab projects reemphasizes the concepts learned in the lectures using real-world and synthetic data. The students will be exposed to developing algorithms to solve pattern classification problems and evaluate the performance of their design. At the end of the course, the students will be able to analyze and understand the requirements for a pattern classification problem, make appropriate feature choices and machine learning approach, implement a functional intelligent system that will learn and adapt to perform the given task.

- **Potential Careers**

Pattern classification is required in almost every aspect of life and especially with technologies that require intelligence in optimizing performance or assisting in making critical decision in areas such as Medical, Military etc. Hence, knowledge gained from this course will be an attractive attribute in securing a career as a *Design Engineer* for development of intelligent systems for various application areas.

- **Potential Employers**

Career employment opportunities exist as a *Design Engineer* in companies that create systems with *intelligence* [Telecommunications (e.g. Smart Phones), Biomedical (e.g. Decision Support Systems), Military (e.g. Land-mine detection), Weather Stations, Robotics etc...].

- **Graduate Studies**

The knowledge/skill acquired will be a valuable asset for students planning for Graduate Studies as you will need these skills in most cases for validation of your research hypothesis and evaluation of the system performance.