Instructor and Office Hours:
Dr. Arun Ross (rossarun at cse.msu.edu)
Office: 3142 Engineering Building
Office hours: Wednesday, 11:00am – 12:00pm.

Lecture Details:
Time: Monday and Wednesday, 3:00pm – 4:20pm.
Room: C001 Wilson Hall

Textbook:

Prerequisites:
CSE 232, MTH 314, and STT 441, or equivalent courses.
An undergraduate level understanding of probability, statistics and linear algebra is assumed. A basic knowledge of Matlab will be useful.

Course Description:
This course will introduce a graduate audience to salient topics in statistical pattern recognition. These include concepts in Bayesian decision theory, parametric and non-parametric density estimation schemes, linear discriminant functions, neural networks and unsupervised clustering. Topics in dimensionality reduction, boosting and bagging will also be visited. The project component of this course will test the student’s ability to design and evaluate classifiers on datasets.

Course Topics:
- Introduction to pattern recognition
- Bayesian decision theory
- Density estimation schemes
- Nearest-neighbor rule
- Linear discriminant functions
- Neural networks
- Clustering
- Dimensionality reduction
- Boosting and Bagging

Grading:
The tentative weight associated with each grading component is as follows:

- Homework - 30%
- Quiz - 20%
- Midterm exam - 15%
- Project - 15%
- Final exam - 20%

Final grades will be assigned based on the following scale:

- 90 and above: 4.0
- 85 - 89: 3.5
- 80 - 84: 3.0
- 70 - 79: 2.5
- 60 - 69: 2.0
- Below 60: 1.0

Grading Policy:
- A hard-copy of the homework has to be turned in before lecture begins on the due date.
- No make-up for quizzes.
- Make-up for exams will be issued only under exceptional circumstances provided prior arrangements are made with the instructor.
- Instructor reserves the right to deny requests for make-up exams.

Course Outcomes:
1. A good knowledge of Bayesian decision theory and Bayesian learning.
2. Fundamental understanding of classifiers such as linear discriminant function, quadratic discriminant function, nearest neighbor rule, neural network and SVM.
3. A good understanding of feature selection algorithms.
4. Ability to evaluate the performance of various classifiers on real-world datasets.

Academic Integrity:

Article 2.3.3 of the Academic Freedom Report states "The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." In addition, the Department of Computer Science and Engineering adheres to the policies on academic honesty as specified in General Student Regulations 1.0, Protection of Scholarship and Grades; the all-University Policy on Integrity of Scholarship and Grades; and Ordinance 17.00, Examinations. (See Spartan Life: Student Handbook and Resource Guide)

Therefore, unless authorized by your instructor, you are expected to complete all course assignments, including homework, projects, quizzes, tests and exams, without assistance from any source. You are expected to develop original work for this course; therefore, you may not submit course work you completed for another course to satisfy the requirements for this course. Students who violate MSU academic integrity rules may receive a penalty grade, including a failing grade on the assignment or in the course. Contact your instructor if you are unsure about the appropriateness of your course work. (See also the Academic Integrity webpage.)