Course Syllabus	**EECS 4750 – Machine Learning**
Credits & Contact Hours	3 credit hours & three 50-minute lecture contact hrs per week
Coordinator	Dr. Kevin S. Xu
Textbook	Machine Learning: An Algorithmic Perspective (Second Edition) by Stephen Marsland, CRC Press, 2015.
Course Information	This course emphasizes learning algorithms and theory including concept, decision tree, neural network, computational, Bayesian, evolutionary, and reinforcement learning. Prerequisite: EECS 2110 and MATH 2890 and MIME 4000 Elective course
Specific Goals-Student Learning Objectives	Upon completion of this course, students will be able to 1. Analyze and identify significant characteristics of data sets 2. Develop an understanding of training a learning algorithm including over-fitting, noise, convergence and stopping criteria 3. Match a data set with the most promising inductive learning algorithms 4. Understand and implement the training, testing, and validation phases of learning algorithms development and deployment 5. Determine the computational complexity associated with development and execution of learning algorithms for a given data set. 6. Develop hands on experience with the leading set of inductive learning algorithms. 7. Apply machine learning algorithms for classification and functional approximation or regression.
Topics	1. Naïve Bayes Classifier 2. Linear and Logistic Regression 3. Multi-Layer Perceptron Neural Network 4. Support Vector Machine 5.Decision Trees 5. Dimensionality Reduction 6. K-Means Clustering 7. Gaussian Mixture Models 8. Kernel Density Estimation 9. Bayesian Networks 10. Reinforcement Learning