



University of Tehran
School of Electrical and Computer Engineering

Course:	8101580 –Pattern Recognition									
Course type:	EE*						CE*			Credit: 1
	Com	E	P	B	Con	D	SW	HW	IT	
	Required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Elective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Level:	Undergraduate <input type="checkbox"/> Graduate <input checked="" type="checkbox"/>									
Co-requisite(s):	None.									
Prerequisite(s):	None.									
Prerequisite by topic:	Programming, Engineering Probability									
Textbook(s):	[1] R. O. Duda, P. E. Hart, and D. G. Stork, Pattern Classification. 2000. [2] S. Theodoridis and K. Koutroumbas, Pattern Recognition, 2009.									
Coordinator:	Araabi, Professor, School of ECE									
Goals:	The course provides an overview of the theory, principles and algorithms used in machine learning to construct high performance information processing systems that learn from experience. The course discusses main and modern concepts for model selection and parameter estimation in recognition, decision making and statistical learning problems. Special emphasis will be given to classification, feature selection, neural network classifiers and density estimation in supervised mode of learning.									
Outcome:	Upon successful completion of the course, students will be able to 1. understands the fundamental pattern recognition and machine learning theories 2. design and implement certain important pattern recognition techniques 3. apply the pattern recognition theories to applications of interest.									
Topics:	1) Introduction to pattern recognition 2) Statistical pattern recognition 3) Feature extraction and feature conditioning 4) Linear classifiers 5) Support vector machine 6) Artificial neural network for pattern recognition 7) Clustering									
Computer usage:	MATLAB									
Assignments:	5 to 7 homework assignments									

Projects:	1 project.
Grading:	Assignments: 15 % Project: 15% Midterm exams: 25 % Final exam: 45 %
Further readings:	[1] C. M. Bishop, Pattern Recognition and Machine Learning, vol. 4, no. 4. 2006. [2] C. Bishop, Neural Networks for Pattern Recognition, vol. 1995. 1995.
Prepared by:	Araabi, Professor, School of ECE
Date:	23 August 2017

*EE: Electrical Engineering		CE: Computer Engineering	
Com	Communications	SW	Software
E	Electronics	HW	Hardware
P	Power	IT	Information Technology
B	Bioelectronics		
Con	Control		
D	Digital System		