Master of Science in Artificial Intelligence (MSAI)

Course Name	Pattern Recognition		التعرف على الأنماط		
Course Information	Course Code	Course No.	Credit Hour	Prerequisite(s)	
	0911-1667	667	3 (3-0-6)	Machine Learning	
Course Track	Program Core		Electives		

Course Description

This course introduces students to the foundations of pattern recognition algorithms and techniques. Challenges include constructing probabilistic and pattern-based representations of data domains in addition to making inferences about pattern identities and classes.

Topics covered in this course include: statistical and structural methods; data structures for pattern representation; feature discovery and selection; classification vs. description; parametric and nonparametric classification; supervised and unsupervised learning; use of contextual evidence; clustering; recognition with strings; and small sample-size problems.

Course Outcomes

After the completion of this course, the student will be able to:

- Describe pattern recognition theories, such as Bayes classifier, linear discriminant analysis and Hypothesis testing. [A]
- 2. **Identify** modern methods for recognition of patterns in varied applications such as digital images, human speech and sound, strings and sequences. **[B]**
- 3. **Construct** appropriate feature representations for a given recognition problem. **[C]**
- 4. **Use** different approaches like: statistical techniques, heuristic search, Markov models, template matching, grammatical inference and neural networks for pattern recognition problems. **[D]**
- 5. Apply pattern recognition techniques in practical problems. [E]

Assessment Policy (PC)	Assignments	15%	Quiz		Capstone Project	40 %		
	Midterm	15%	Final	30%				
Textbook	Sergios Theodoridis and Konstantinos Koutroumbas, "Pattern Recognition & Matlab Intro:							
	Pattern Recognition," 4 th Edition, Academic Press, 2008. ISBN: 1597492728.							
References	Christopher M. Bishop "Pattern Recognition and Machine Learning", Springer, 2007. ISBN:							
	0387310738.							