



**Philadelphia University  
Faculty of Engineering  
Department of Computer Engineering  
First Semester, 2015/2016**

**Course Syllabus**

<b>Course Title: Artificial Intelligence</b>	<b>Course code: 630423</b>
<b>Course Level: 4<sup>th</sup> year</b>	<b>Course prerequisite (s) and/or co requisite (s): Discrete Mathematics 630260</b>
<b>Class Time: 12:45-14:15</b>	<b>Credit hours: 3</b>

**Academic Staff Specifics**

<b>Name</b>	<b>Rank</b>	<b>Office Number and Location</b>	<b>Office Hours</b>	<b>E-mail Address</b>
<b>Dr. laheeb Al- Zubeidy</b>	<b>Associate Prof.</b>	<b>712</b>	<b>14 :00-16 :00</b>	<b>laheeb_alzubaidy@yahoo.com</b>

**Course description:**

To cover the principles of artificial intelligence, knowledge acquisition, representation and processing. It covers the design and implementation of intelligent systems and their engineering applications.

**Course objectives:**

At Completing this course the student should be able to:

- Understand the principles of artificial intelligence
- Design and implement microprocessor-based real-time systems
- Deal with uncertainty and vague information

**Course components**

- **Books (title , author (s), publisher, year of publication)**

**Artificial Intelligence: A Guide to Intelligent Systems**, By: Michael Negnevitsky, Addison Wesley, UK, 2002, ISBN:0-201-71159-1, [www.pearsonedu.com](http://www.pearsonedu.com),

- **Support material (s) (vcs, acs, etc).  
Matlab simulation program.**

**Teaching methods:**

Lectures, tutorials, problem solving, and computer aided design and simulation.

**Learning outcomes: upon completing this course, the student should have: -**

- Knowledge and understanding
  - Basic understanding of expert systems.
  - Basic understanding of Neural networks and fuzzy logic concepts.
  - The ability to design neuro and fuzzy controllers.
  
- Cognitive skills (thinking and analysis).
  - The ability to understand different available architectures of intelligent systems.
  
- Communication skills (personal and academic).
 

Key aspects of projects presentation are introduced.
  
- Practical and subject specific skills (Transferable Skills).
  - The ability to design some kind's expert systems.
  - The ability to use of Matlab software package tool will help the student in the design and analysis of real expert systems.

<b>Course Intended Learning Outcomes</b>									
<b>A - Knowledge and Understanding</b>									
A1.	A2.	A3.	A4.	A5.	A6.	A7.	A8.		
<b>B - Intellectual Skills</b>									
B1.	B2.	B3.	B4.	B5.	B6.	B7.	B8.	B9.	
<b>C - Practical Skills</b>									
C1.	C2.	C3.	C4.	C5.	C6.	C7.	C8.	C9.	C10.
<b>D - Transferable Skills</b>									
D1.	D2.	D3.	D4.	D5.	D6.	D7.			

**Assessment instruments**

- Short reports and/ or presentations, and/ or Short research projects
- Quizzes.
- Assignments.
- Final examination: 50 marks

<b><u>Allocation of Marks</u></b>	
<b>Assessment Instruments</b>	<b>Mark</b>
First examination	<b>20</b>
Second examination	<b>20</b>
Final examination:	<b>40</b>
Reports, research projects, Quizzes, Assignments, Projects	<b>20</b>
<b>Total</b>	<b>100</b>

**Documentation and academic honesty**

- Documentation style (with illustrative examples)

There is no specific documentation.

**Course academic calendar**

<b>week</b>	<b>Basic and support material to be covered</b>	<b>Homework/reports and their due dates</b>
<b>1, 2, 3</b>	An Overview of Artificial Intelligence: What is AI, Expert systems, Intelligent systems? History of AI. Knowledge representation.	
<b>4, 5, 6</b>	Rule-based Expert Systems: Structure of a rule-base expert system, Characteristics of an ES, Forward & backward chaining inference techniques, Conflict resolution.	<b>Quiz 1</b>
<b>7, 8</b>	Uncertainty Management in Rule-Based Systems: Probability theory, Bayesian reasoning, Certainty factors, Fuzzy logic.	First Exam. 18-26\11\2015
<b>9, 10</b>	Fuzzy Expert Systems: Fuzzy sets, Linguistic variables and hedges, Fuzzy rules, Fuzzy inference, fuzzy system	<b>HW -1 Due</b>

<p><b>11, 12, 13</b></p>	<p>Frame-Based Expert Systems: Frame-based system structure, Inheritance in frame-based systems, Methods and demons, Interaction of frames &amp; rules. Artificial Neural Networks: What is NN, Multi-layer neural networks, Learning of NNs, Self- organizing NNs.</p>	<p><b>2<sup>nd</sup> Exam</b> 27\12\2015-5\1\2016 <b>HW-2 Due</b></p>
<p><b>14, 15</b></p>	<p>Hybrid Intelligent Syst Neural expert systems, Neuro-fuzzy systems, Adaptive neuro-fuzzy inference system. Knowledge Engineering &amp; Data Mining: What is knowledge engineering? Data mining and knowledge discovery.</p>	<p><b>Quiz 2</b></p>
<p><b>16</b></p>		<p><b>Final Exam</b> 30\1-7\2\2016</p>

**Expected workload:**

**On average students need to spend 2 hours of study and preparation for each 50-minute class/tutorial.**

**Attendance policy:**

**Absence from classes and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.**

**Course references**

**Books**

- Peter Jackson, "Introduction to Expert Systems", 3rd edition, Addison-Wesley, USA 1999, ISBN: 0-201-87686-8
- Edmund C. Payne, & Ropert C. McArthur, "Developing Expert Systems: A Knowledge Engineer's Handbook for Rules & Objects", John Wiley & Sons, USA, 1990.
- Jeffrey johnson & Philip Picton, "Concepts in Artificial Intelligence", Butterworth-HeinemannLtd, UK, 1995
- M. Chadwick & J.A. Hannah, "Expert Systems for Personal Computers: an Introduction to Artificial Intelligence", Galgotia Publications Ltd, India, 1997.
- Microcomputer Systems: Real-Time Interfacing, Brooks-Cole Publisher, 2000.

**Websites**

- [www.pearsonedu.com](http://www.pearsonedu.com),
- [www.booksites.net/negnevitsky](http://www.booksites.net/negnevitsky)