Philadelphia University
Course Outline

Course Title	:	**INTELLIGENT SYSTEMS**	**630423**
Prerequisite	:	Discrete Mathematics	630260
Text Book	:	**Artificial Intelligence: A Guide to Intelligent Systems**, By: Michael Negnevitsky, Addison Wesley, UK, 2002, ISBN:0-201-71159-1,*www.pearsonedu.com*, *www.booksites.net/negnevitsky*	
Credit Hours	:	3 **Level** 4th year	

Course Goals:

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.

Time Schedule:

Duration:	16 weeks	**Lectures:**	3 hours /week
Tutorial:	None	**Laboratories:**	None

Objectives:

At Completing this module the student should be able to :

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

Course Contents

		Week
❖	**Chapter 1: An Overview of Artificial Intelligence:** What is AI, Expert systems, Intelligent systems? History of AI. Knowledge representation techniques	4
❖	**Chapter 2: Rule-based Expert Systems:** Structure of a rule-base expert system, Characteristics of an ES, Forward & backward chaining inference techniques, Conflict resolution.	4
❖	**Chapter 3: Uncertainty Management in Rule-Based Systems:** Probability theory, Certainty factors, Fuzzy logic.	2
❖	**Chapter 4: Fuzzy Expert Systems:** Fuzzy sets, Linguistic variables and hedges, Fuzzy rules, Fuzzy inference, Building a fuzzy expert system.	2
❖	**Chapter 5: Frame-Based Expert Systems:** Frame-based system structure, Inheritance in frame-based systems, Methods and demons, Interaction of frames & rules.	1
❖	**Chapter 6: Artificial Neural Networks:** What is NN, Multi-layer neural networks, Learning of NNs, Self-organizing NNs.	1
❖	**Chapter 8: Hybrid Intelligent Systems:** Neural expert systems, Neuro-fuzzy systems, Adaptive neuro-fuzzy inference system.	1
❖	**Chapter 9: Knowledge Engineering & Data Mining:** What is knowledge engineering? Data mining and knowledge discovery.	1

Mode of Assessment

1-	**First Exam**	**20%**
2-	**Second Exam**	**20%**
3-	**Qizzes**	**20%**
4-	**Final Exam**	**40%**

References

1- **Peter Jackson**, "Introduction to Expert Systems", 3rd edition, Addison-Wesley, USA 1999, ISBN: 0-201-87686-8

2- **Edmund C. Payne, & Ropert C. McArthur**, "Developing Expert Systems: A Knowledge Engineer's Handbook for Rules & Objects", John Wiley & Sons, USA, 1990.

3- **Alison Cawsey**, "The Essence of Artificial Intelligence", Prentice Hall, USA, 1998.

4- **Jeffrey johnson & Philip Picton**, "Concepts in Artificial Intelligence", Butterworth-HeinemannLtd, UK, 1995.

5- **John Durkin**, "Expert Systems Design & Development", Macmillan Publishing Co, USA, 1994.