" حيث تصبح الرؤية واقعاً"

"When Vision Becomes Reality"

" عراقة وجودة"

Tradition and Quality

Detailed Course Description - Course Plan Development and Updating Procedures/ Computer Information Science Department	QF01/0408-3.0E

Faculty	**Faculty of Science and Information Technology**	Department	**Computer Science**
Course Number	**0112415**	**Course Title**	**Artificial Intelligence** الذكاء الاصطناعي
Number of Credit Hours	**3**	**Pre-Requisite/Co-Requisite**	**Algorithms (0112313)**

Brief Course Description

The course aims to: presenting the basic concepts of AI; Describing how to represent knowledge used in AI in both theory and practice with careful attention to the underlying principles of logic, search, and probability; Describing concepts of state space search and its strategies; Presenting blind and heuristic search algorithms and how to use these algorithms for problem solving; Describing the main concepts of production systems; Presenting basic concepts and roles of AI programming (PROLOG); Defining concepts of expert systems; and Defining concepts of machine learning.

	Course Goals and Learning Outcomes
Goal 1	**Presenting the concepts and Benefits of AI.**
Learning Outcomes	**1.1** Understanding the basic concepts and techniques of AI. **1.2** Learning how to represent AI knowledge in both theory and practice with careful attention to underlying principles of logic, search, and probability.
Goal 2	**Describing concepts of state space search and its strategies.**
Learning Outcomes	**2.1** Learning the state space search and its strategies. **2.2** Learning the concepts of blind search algorithms. **2.3** Learning Depth -first search and Breadth -first search algorithms. **2.4** Learning the concepts of heuristic search algorithms. **2.5** Learning how to use algorithms for problem solving and how to select appropriate search paradigms for problems.
Goal 3	**Describing the concepts of production systems.**
Learning Outcomes	**3.1** Understanding the concepts of production systems. **3.2** Learning the main components of production systems.
Goal 4	**Presenting basic concepts and roles of AI programming (PROLOG).**
Learning Outcomes	**4.1** Learning the concepts of PROLOQ language. **4.2** Learning the statements, rules and queries of Prolog language.
Goal 5	**Describing Expert Systems and Machine learning.**
Learning Outcomes	**5.1** Learning the concepts of expert systems and applications. **5.2** Learning the concepts of Knowledge Based Systems. **5.3** Learning the concepts of machine learning.

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Textbook	Artificial Intelligence: Building Intelligent Systems. (1st edition) by P. Kulkarni and P. Joshi, PHI Learning Private Limited, 2015. ISBN: 978-81-203-5046-5
Supplementary References	**1.** Russell and Norvig, Artificial Intelligence: A Modern Approach, 3rd edition, Pearson Education, Inc., Prentice-Hall-Series, **2010**. **2.** Jeff Heaton, Artificial Intelligence for Humans, Volume.1, Fundamental Algorithms, Kindle Edition, 2013. **3.** Alan Mackworth and David Poole, Artificial Intelligence: Foundations of Computational Agents, Cambridge Canada Press, 2010. **4.** Robots Are People Too: How Siri, Google Car, and Artificial Intelligence Will Force Us to Change Our Laws by John F. Weaver. Praeger,Nov. 2013. ISBN: 1440829462, 9781440829468

Course Timeline				
Week	**Number of Hours**	**Course Topics**	**Pages (Textbook)**	**Notes**
01	1 1 1	**1. Introduction to artificial intelligence** – Artificial intelligence history and foundation – Birth of artificial intelligence – Artificial intelligence techniques – Problem solving with AI	TXT: 1-7	
02	1 1	**2. Problem solving** – Problem solving process – Formulating problems – Problem types and characteristics	TXT: 15-20	
02-03	1 1 1	**3. Uniformed search** – General search algorithms – Uniformed search methods (Breadth first search, Depth first search)	TXT:39-47	
04-05	1 1 1	**4. Informed search** – Generate and test – Best first search – Greedy search – A* search – Local search algorithms and optimization problems (hill climbing search, genetic algorithms)	TXT- 56-65, 69-83	
06	1 1 1	**Revision** **First exam 20%**		

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07	1 1 1	**5. Intelligent agents** – What is an intelligent agents – Rationality and rational agent – Performance measure		TXT: 95-99	
08-10	1 1 1	**7. Knowledge and reasoning** – Knowledge representation – Knowledge-based agents – The Wumpus world – Logic – Prepositional logic – Predicate logic – Unification and lifting inference in FOL – Representing knowledge using rules – Prolog		TXT: 134-160, 477-483	
11-12	1 1 1	**8. Uncertain Knowledge and reasoning** – Uncertainty and methods – Probabilistic reasoning – Perception – Other techniques in Uncertainty and – reasoning process **Second Exam 20%**		TXT:170,171, 176, 182, 190-192	
13	1 1 1	**9. Planning** – Planning problem – Simple planning agent – Planning as a state space search		TXT: 199-202, 210-212	
14	1 1 1	**10. Learning** – What is machine learning – Learning paradigms		TXT: 233-238	
15	1 1 1	**11. Experts systems** – Architecture of experts systems – Existing experts systems – Rule based expert systems		TXT:267-270, 271, 276-277	
16	1 1 1	**Final Exam 50%**			

Theoretical Course Evaluation Methods and Weight	Participation = 10% First Exam 20% Second Exam 20% Final Exam 50%	**Practical (Clinical) Course Evaluation Methods**	Semester Students' Work = 50% (Reports, Research, Quizzes, Etc.) Final Exam = 50%

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Approved by Head of Department		Date of Approval	

Extra information (to be updated every semester by corresponding faculty member)

Name of Teacher		Office Number	
Phone Number (Extension)		Email	_____@zuj.edu.jo
Office Hours			