



University/Academy: Arab Academy for Science and Technology & Maritime Transport
Faculty/Institute: College of Computing and Information Technology
Program: Computer Science

Form No. (12)
Course Specification

1- Course Data

Course Code: CS467	Course Title: Advanced Artificial Intelligence	Academic Year/Level: Year 4 / Semester 8
Specialization: Computer Science	No. of Instructional Units: 2 hrs lecture 2 hrs lab	Lecture:

2- Course Aim	This course introduces students to Planning - Probabilistic reasoning, Bayes Nets – Learning, Statistical Learning and Reinforcement Learning; it also introduces Neural Networks and its variants proposed by experts in the field.
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3- Intended Learning Outcome:

a- Knowledge and Understanding	<p>Students will be able to demonstrate knowledge of:</p> <p>K10. Current developments in computing and information research. K17. Show a critical understanding of the principles of artificial intelligence, image, and pattern recognition. .K19. Select advanced topics to provide a deeper understanding of some aspects of the subject, such as hardware systems design, object-oriented analysis and design, and artificial intelligence, and parallel and concurrent computing.</p> <ul style="list-style-type: none">• Be familiar with the rules of AI and semantic nets• Learn advanced searching techniques• Comprehend the concepts of Intelligent agents and their application in searching• Understand Constrain-satisfaction problems and be able to solve them• Understand the different Knowledge representations.• Be familiar with the different reasoning techniques• Learn logic programming and resolution of problems,• Comprehend reasoning with uncertainty vs traditional reasoning• Understand Syntax and grammar parsing in Natural language processing• Understand ambiguity and its effect on grammar• Learn about machine learning• Introduction to neural networks
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b- Intellectual Skills	<p><u>By the end of the course, the student acquires high skills and an ability to understand:</u></p> <p>I9. Evaluate research papers in a range of knowledge areas</p> <p>I10. Define traditional and nontraditional problems, set goals towards solving them, and. observe results.</p> <p>I11. Perform comparisons between (algorithms, methods, techniques...etc).</p> <p>I17. Identify a range of solutions and critically evaluate and justify proposed design solutions.</p>
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c- Professional Skills	<p><u>By the end of the course the student will have the ability to:</u></p> <p>P14. Specify, design, and implement computer-based systems.</p> <p>P15. Evaluate systems in terms of general quality attributes and possible tradeoffs presented within the given problem.</p> <p>P19. Deploy effectively the tools used for the construction and documentation of software, with particular emphasis on understanding the whole process involved in using computers to solve practical problems.</p>
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d- General Skills	<p>Students will be able to:</p> <p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <p>G7. Show the use of general computing facilities.</p> <p>G8. Demonstrate an appreciation of the need to continue professional development in recognition of the requirement for life-long learning.</p>
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4- Course Content	<table border="1"> <tr> <td data-bbox="531 1563 603 1697">1</td> <td data-bbox="603 1563 1447 1697">Model and the basic concepts of non-Symbolic AI (Neural Networks and Statistical learning) through equations formulating and pseudo code creation.</td> </tr> <tr> <td data-bbox="531 1697 603 1798">2</td> <td data-bbox="603 1697 1447 1798">Use these concepts in designing intelligent systems that can adapt to both uncertainties and changes in their environments.</td> </tr> </table>	1	Model and the basic concepts of non-Symbolic AI (Neural Networks and Statistical learning) through equations formulating and pseudo code creation.	2	Use these concepts in designing intelligent systems that can adapt to both uncertainties and changes in their environments.
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5- Teaching and Learning Methods	Lectures, Projects, Individual study & self-learning.
6- Teaching and Learning Methods for Students with Special Needs	<ul style="list-style-type: none"> • Students with special needs are requested to contact the college representative for special needs (currently Dr Hoda Mamdouh in room C504) • Consulting with lecturer during office hours. • Consulting with teaching assistant during office hours. • Private Sessions for redelivering the lecture contents. <p>For handicapped accessibility, please refer to program specification.</p>
7- Student Assessment:	
a- Procedures used:	Exams and Projects
b- Schedule:	<p>Week 7 exam</p> <p>Projects through the semester</p> <p>Week 16 Final exam</p>
c- Weighing of Assessment:	<p>7th week exam 20%</p> <p>Projects 30%</p> <p>Lab work 10%</p> <p>Final exam 40%</p>
8- List of References:	
a- Course Notes	
b- Required Books (Textbooks)	Stuart Russell and Peter Norvig, <i>Artificial Intelligence: A modern Approach</i> , Prentice-Hall, 3 rd edition, 2009.
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Course Instructor:

Head of Department:

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