

Course Specification

(4101 Artificial Intelligence)

Faculty: HICIT- Higher Institute for Computers & Information Technology

Programme(s) Title: Computer Science

Department Title: Computer Science

Academic year / Level: 4th Year – 1st Semester

Main/Secondary: Main

Date of specification approval: 22/9/2015

A- Basic Information

Title: Artificial Intelligence

Code: 4101

Weekly Hours:

Lecture: 3

Exercise: -

Practical: 3

Total: 6

B- Professional Information

1 - Overall aims of course

This course will introduce the fundamentals AI techniques and approaches starting with the Intelligent Agents and how to implement the multi-agent systems. The search techniques for problem solving such as the depth first search, the breadth first search and the Backtracking algorithms. HEURISTIC search such as generate and test, hill climbing, best first search... etc. Knowledge Representation is discussed through the course such as predicate logic, production rules, semantic network, frames. And some part of course discusses the genetic algorithms.

2- Program ILOs Covered by Course

Program Intended Learning Outcomes			
Knowledge and understanding	Intellectual Skills	Professional and practical skills	General and Transferable skills
a7, a12, a21	b1, b2, b3, b4, b5, b10	c1, c5, c6, c10	d5

3- Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:

- a1. Understand the fundamental principles of artificial Intelligence.
- a2. Explain Java programming language and Prolog.
- a3. Understand the JADE programming package.
- a4. Describe the basic skills Intelligent agents programming.

b- Intellectual skills.

- b1. Solve the problems using various search techniques.
- b2. Construct intelligent agents in various domains.

c- Professional and practical skills.

- c1. Implement various systems in this areas.

d- General and transferable skills.

- d1. write a technical report.
- d2 work with a team to implement different AI System.

4- Contents

Topic	Hours	Lecture	Practical
Introduction to AI	6	3	3
Intelligent Agents	6	3	3
Multi-Agent Systems	6	3	3
Implementing Intelligent Agents	6	3	3
Problem Solving by Search	6	3	3
Backtracking, depth, and breadth first search	6	3	3
Heuristic (Informed) Search	6	3	3
Generate and test, Best first search, A* algorithm.	6	3	3
Hill climbing, Simulated Annealing.	6	3	3
Genetic algorithms.	6	3	3
Knowledge Representation	6	3	3
Production rules, semantic networks, Frames, ... etc.	6	3	3
Course Project	6	3	3

5- Teaching and learning methods

- 4.1 Lectures
- 4.2 Tutorial Exercises
- 4.3 Practical Lab
- 4.4 Discussions.

6-Student assessment methods

- 6.1 Midterm Exam: To assess the knowledge and understanding achieved by the student during the previous weeks.
- 6.2 Final Exam: To evaluate what the student gain at the end of the course, and to assess: the knowledge and understanding, general skills, and intellectual skills.
- 6.3 Course Project: To allow students work in team, and to evaluate knowledge, understanding, intellectual, and transferable skills.
- 6.4 Course Work & Quizzes: To keep the student always in the course, and to evaluate knowledge, understanding, intellectual, and transferable skills.
- 6.5 Practical Exam: to measure the ability of students to design and implement a software program.

Assessment Schedule

Assessment	Week #
Mid Term Exam	8
Final Exam	16
Course Project	3-14
Course Work & Quizzes	2-14
Practical Exam	15

Assessment Weight

Assessment	Weight %
Mid Term Exam	5%
Final Exam	70%
Course Project	10%
Course Work & Quizzes	5%
Practical Exam	10%
Total	100

Course Work & Quizzes: (Short Exams, Assignments, Researches, Reports, Presentations, Class/Project discussion)

7 -List of references

7.1- Essential books (text books)

Artificial Intelligence: A Modern Approach (Second Edition) by Stuart Russell and Peter Norvig

7.2 Recommended books

- Computational Intelligence *A Logical Approach*, David Poole, Alan Mackworth, Randy Goebel

8- Required Facilities

- MS Project SW Package for scheduling projects
- Jade Tool.

9- Course Matrices

9.1-Course Content/ILOs Matrix

Course Contents	a1	a2	a3	a4	b1	b2	c1	d1	d2
Introduction to AI	x	x							
Intelligent Agents	x	x	x	x		x	x		
Multi-Agent Systems	x	x	x	x		x	x		
Implementing Intelligent Agents	x	x	x	x		x	x		
Problem Solving by Search	x	x			x		x		
Backtracking, depth, and breadth first search	x	x			x		x		
Heuristic (Informed) Search	x	x			x		x		
Generate and test, Best first search algorithm.	x	x			x		x		
Hill climbing, Simulated Annealing.	x	x			x		x		
Genetic algorithms.	x	x			x		x		
Knowledge Representation	x	x					x		

Production rules, semantic networks, Frames, ... etc.	x	x					x		
Course Project								x	x

9.2-Learning Methods /ILOs Matrix

Learning Methods	a1	a2	a3	a4	b1	b2	c1	d1	d2
Lectures	x	x	x	x	x	x	x		
Tutorial Exercises					x	x	x		
Practical Lab					x	x	x		
Discussions.					x	x	x	x	x

9.3-Assessment Methods /ILOs Matrix

Assessment Methods	a1	a2	a3	a4	b1	b2	c1	d1	d2
Mid Term Exam	x	x	x	x	x	x	x		
Final Exam	x	x	x	x	x	x	x		
Course Project	x	x	x	x	x	x	x	x	x
Course Work & Quizzes	x	x	x	x	x	x	x	x	x
Practical Exam	x	x	x	x	x	x	x		

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