Mansoura University

Faculty of Computers and Information Sciences

Course Specifications of

Artificial Intelligence(2) to Computer Science – CS011

University: Mansoura University **Faculty**: Computer and Information Sciences

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Program on which the course is given: __

Department offering the course: Department of Computer Science

Academic year/ Level: Fourth Year

Date of specification approval:

A- Basic Information

Title : Artificial Intelligence(2) **Code :** UNI111T

Credit Hours : 3 **Lecture :** 2 **Tutorial :** 2 **Practical :** 0

B- Professional Information

1- Overall Aims of the Course

This course aims to:

- Present both the traditional and the modern aspects of 'AI and Soft Computing' in a clear, insightful and highly comprehensive writing style.
- Provide an in-depth analysis of the mathematical models and algorithms, and demonstrate their applications in real world problems of significant complexity.

2- Intended Learning Outcomes of the course (ILOs)

By completing this course successfully, the student will be able to:

a- Knowledge and Understanding

a1. Essential facts, concepts, principles and theories relating to computing and information and computer applications as appropriate to the program of study.
a2. Modeling and design of computer-based systems bearing in mind the trade-offs.
a3. Tools, practices and methodologies used in the specification, design, implementation and evaluation of computer software systems.
a4. Criteria and specifications appropriate to specific problems, and plan strategies for their solution.
a5. The extent to which a computer-based system meets the criteria defined for its current use and future development.
a6. The current and underlying technologies that support computer processing and inter-computer communication.
a10. Current developments in computing and information research.
a13. Use high-level programming languages.
a16. Know and understand the principles and techniques of a number of application areas informed by the research directions of the subject, such as artificial intelligence, natural language processing, data mining, databases and computer graphics.
a17. Show a critical understanding of the principles of artificial intelligence, image, and pattern recognition.
a19. 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.

b- Intellectual Skills

b1. Analyze computing problems and provide solutions related to the design and construction of computing systems.
b2. Realize the concepts, principles, theories and practices behind computing and information as an academic discipline.

b4. Analyze, propose and evaluate alternative computer systems and processes taking into account limitations, and quality constraints.
b5. Make ideas, proposals and designs using rational and reasoned arguments for presentation of computing systems.
b6. Evaluate the results of tests to investigate the functionality of computer systems.
b9. Evaluate research papers in a range of knowledge areas.
b10. Define traditional and nontraditional problems, set goals towards solving them, and. observe results.
b11. Perform comparisons between (algorithms, methods, techniques...etc).
b12. Perform classifications of (data, results, methods, techniques, algorithms..etc.).
b13. Identify attributes, components, relationships, patterns, main ideas, and errors.
b14. Summarize the proposed solutions and their results.
b15. Restrict solution methodologies upon their results.
b18. Solve computer science problems with pressing commercial or industrial constraints.
b19. Generate an innovative design to solve a problem containing a range of commercial and industrial constraints.

c- Professional and Practical Skills

c1. Operate computing equipment, recognizing its logical and physical properties, capabilities and limitations.
c2. Implement comprehensive computing knowledge and skills in projects and in deployment of computers to solve position practical problems.
c3. Deploy the equipment and tools used for the construction, maintenance and documentation of computer applications.
c4. Apply computing information retrieval skills in computing community environment and industry.
c5. Develop a range of fundamental research skills, through the use of online resources, technical repositories and library-based material
c8. Handle a mass of diverse data, assess risk and draw conclusions.
c9. Use appropriate programming languages, web-based systems and tools, design methodologies, and knowledge and database systems.
c17. Apply the principles of effective information management, information organization, and information-retrieval skills to information of various kinds, including text, images, sound, and video.

d- General and Transferable Skills d1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning. d2. Demonstrate skills in group working, team management, time management and organizational skills. d5. Exhibit appropriate numeracy skills in understanding and presenting cases involving a quantitative dimension.

3- Contents

No	Course Content	Lecture	Tutorial	Total
1	Introduction to Artificial Intelligence and Soft Computing.	2	2	4
2	Production Systems	2	2	4
3	Problem Solving by Intelligent Search	2	2	4
4	Data Reduction using Rough Sets	2	2	4
5	Representing Knowledge	4	4	8
6	Reasoning and Control	4	4	8
7	Reasoning under Uncertainty	4	4	8
8	Machine Learning	4	4	8
	Total Hours	24	24	48

4- Assessment Schedule

Assessment Method	No.	Description	Week No.	Weight (%)
Mid-term Exam	1	Midterm Exam	3	5
Mid-term Exam	2	Midterm Exam	7	20
Practical Exam	4	Practical Exam	10	15
Quiz and Tasks	5	Final Exam	14	60
Total				100

5- List of references

5.1 Course Notes

- Lecture handouts delivered to students at the end of each lecture.

5.2 Essential Books (Text Books)

- Russell, S and Norvig, P Artificial Intelligence: A Modern Approach (2nd Edition), Prentice Hall 2003 .
- Konar, Amit.Artificial intelligence and soft computing : behavioral and cognitive modeling of the human brain, CRC Press LLC, 2000 .
- Pawlak, Rough Sets: aspects and prospectives about data, 1992 .

6- Facilities Required for Teaching and Learning -

Data show.

- Speakers for audio and video files used to practice listening.

Course Content/ILO Matrix

Course Content	a1	a3	a6	b1	b2	b4	c2	c4	c5	c13	d1	d3	d7	d8
Introduction to the fundamental concepts of computer science.	•		•						•					
Algorithmic foundations of computer science		•		•	•	•	•			•	•	•		•
Hardware issues such as number systems and computer architectures	•		•				•	•					•	
Software issues such as operating systems programming languages, compilers, networks, and human-computer interaction.	•		•	•	•	•	•	•		•		•	•	

Learning Method/ILO Matrix

Course Content	a1	a3	a6	b1	b2	b4	c2	c4	c5	c13	d1	d3	d7	d8

Lectures	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Tutorials					•	•	•	•	•	•	•	•	•	•

Assessment Methods/ILO Matrix

Assessment	a1	a3	a6	b1	b2	b4	c2	c4	c5	c13	d1	d3	d7	d8
Assignment	•	•	•					•		•	•	•	•	•
Midterm Exam	•	•	•	•	•	•	•		•					
Oral exam	•	•	•					•	•	•	•	•	•	•
Final Exam	•	•	•	•	•	•	•		•					

Course Coordinator: Prof. Magdi Zakaria
Head of Department: Dr. Samir ElMougy
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