Mansoura University

Faculty of Computers and Information Sciences

Course Specifications of

Knowledge Based Systems 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 : Knowledge Based Systems **Code :** UNI111T

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

B- Professional Information

1- Overall Aims of the Course

This course aims to:

- This course introduces students to learn how to build expert systems in a variety of application areas.
- Learn the student how knowledge Engineer select the software and hardware tools for the project, extract the necessary knowledge from the Domain Expert and implement the knowledge in a correct and efficient knowledge base.

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.

a6 The current and underlying technologies that support computer processing and inter-computer communication.

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.

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.

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

c2 Implement comprehensive computing knowledge and skills in projects and in deployment of computers to solve position practical problems.
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
c10 Communicate effectively by oral, written and visual means.
c14 Prepare technical reports, and a dissertation, to a professional standard; use IT skills and display mature computer literacy.
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.
c21 Prepare technical reports, and a dissertation, to a professional standard.

d- General and Transferable Skills

3- Contents

No	Course Content	Lecture	Tutorial	Total
1	Introduction to : knowledge based expert systems, conventional programming versus knowledge engineering.	4	4	8
2	Human problem solving : Human knowledge Acquisition - the production system as a processing model - problem solving - varieties of knowledge - the nature of expertise.	4	4	8
3	Knowledge Representation issues.	2	2	4
4	Strategies for representing knowledge : Using Predicate Logic - Resolution in Predicate Logic.	2	2	4
5	representing knowledge : Using Rules - Forward and Backward Reasoning.	2	2	4
6	representing knowledge : Using Semanic network.	2	2	4
7	representing knowledge : Using Frames.	2	2	4
8	Uncerainty - Symbolic Reasoning under Uncerainty.	2	2	4
9	Languages and tools : Levels of soaftware, AI language and environments.	2	2	4
10	Building Expert Systems in CLIPS.	2	2	4
	Total Hours	24	24	48

4- Assessment Schedule

Assessment Method	No.	Description	Week No.	Weight (%)
Home work weekly in the Computer Lab	1	Home work weekly in the Computer Lab	3	5
Practical Exam	2	Practical Exam	7	5

Oral Exam and discussion to the Term project	3	Oral Exam and discussion to the Term project	10	10
Mid Term Exam	4	Mid Term Exam	14	20
Final Term Exam	5	Final Term Exam		60
Total				100

5- List of references

5.1 Course Notes

- An Introduction to Expert Systems (Knowledge Base)

5.2 Essential Books (Text Books)

- DAN W. PATTERSON, " Artificial Intelligence an Expert Systems " 2004 .
- Peter Jackson, " Introduction to Expert Systems " .
- Robert I. Levine, " A Comprehensive Guide to AI and Expert Systems".

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
Introduction to : knowledge based expert systems, conventional programming versus knowledge engineering.		•		•	•	•	•			•

Human problem solving : Human knowledge Acquisition - the production system as a processing model - problem solving - varieties of knowledge - the nature of expertise.	•		•				•	•		
Knowledge Representation issues.	•		•	•	•	•	•	•		•
Strategies for representing knowledge : Using Predicate Logic - Resolution in Predicate Logic.	•		•	•		•		•		•
representing knowledge : Using Rules - Forward and Backward Reasoning.	•	•		•		•	•	•		•
representing knowledge : Using Semanic network.			•		•			•		
representing knowledge : Using Frames.		•		•		•	•		•	
Uncerainty - Symbolic Reasoning under Uncerainty.							•		•	
Languages and tools : Levels of soaftware, AI language and environments.		•		•				•	•	•
Building Expert Systems in CLIPS.	•	•			•		•	•	•	•

Learning Method/ILO Matrix

Course Content	a1	a3	a6	b1	b2	b4	c2	c4	c5	c13
Lectures	•	•	•	•	•	•	•	•	•	•
Tutorials					•	•	•	•	•	•

Assessment Methods/ILO Matrix

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

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