



COURSE SPECIFICATION

(KNOWLEDGE BASE SYSTEMS)

Programme(s) on which the course is given	CS and IT
Major or Minor element of programs	Major
Department offering the program	Computer Science
Department offering the course	Computer Science
Academic year / Level	4 th Year / 1 st Semester

A- Basic Information

Title	Knowledge Base Systems			Code	CS471	
Credit Hours	Lecture	3	Tutorial	3	Practical	-
	Total				6	

B- Professional Information

1- Overall Aims of Course

- Understand the principles and operations of knowledge base systems
- Understand the design of knowledge base
- Understand the applications of knowledge base

2- Intended Learning Outcomes of Course (ILOs)

2a- Knowledge and understanding

- a2 Understand and apply a wide range of principles and tools available to the software engineer, such as design methodologies, choice of algorithm, language, software libraries and user interface technique.
- a6 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, databases and computer graphics.

2b- Intellectual skills

- b2 Analyze the requirements of a range of computer-based systems and examine the design alternatives based on the constraints imposed by society, organizations, and technology.
- b3 Identify a range of solutions and critically evaluate and justify proposed

design solutions.

b4 Solve computer science problems with pressing commercial or industrial constraints.

2c- Professional and practical skills

c1 Plan and undertake a major individual project.

c2 Prepare and deliver coherent and structured verbal and written technical reports.

c3 Give technical presentations suitable for the time, place and audience.

c7 Apply computer science skills in a commercial or industrial environment.

2d- General and transferable skills

d1 Display an integrated approach to the deployment of communication skills.

d2 Use IT skills and display mature computer literacy.

d7 Demonstrate significantly enhanced group working abilities.

d8 Retrieve information from a variety of sources such as libraries, printed or electronic sources.

3- Contents

Topic	No. of Hours	Lecture	Tutorial /Practical
1 Introduction	3	3	3
2 Fundamentals of Expert Systems <ul style="list-style-type: none"> • History of Expert Systems • Basic Concepts of Expert Systems • Structure of Expert Systems. • The Human Element in Expert Systems. • How Expert Systems Work. • Problem Areas Addressed by Expert Systems. • Benefits of Expert Systems • Problems and Limitations of Expert Systems • Types of Expert Systems. 	12	6	6
3 Knowledge Acquisition and Validation <ul style="list-style-type: none"> • Knowledge Engineering. • Scope of Knowledge. • Difficulties in Knowledge Acquisition. • Methods of Knowledge Acquisition • Interviews • Tracking Methods • Selecting an Appropriate Knowledge Acquisition Method • Validation and Verification of the Knowledge Base 	18	9	9
4 Knowledge Representation <ul style="list-style-type: none"> • Introduction. • Representation in Logic and Other Schemas. • Semantic Networks. • Production Rules. 	12	6	6

<ul style="list-style-type: none"> • Frames. • Multiple Knowledge Representation • Experimental Knowledge Representations. • Representing Uncertainty 			
5 Inferences, Explanations and Uncertainty <ul style="list-style-type: none"> • Reasoning in Artificial Intelligence. • Forward and Backward Chaining. • The Inference Tree. • Inferencing with Frames. • Case-based Reasoning. • Explanation and Metaknowledge. • Inferencing with Uncertainty 	12	6	6
6 Building Expert Systems <ul style="list-style-type: none"> • Introduction • The Development Life Cycle. • Organizing the Development Team. • The Future of Expert Systems. • Case study 	24	12	12
Total number of Hours for the course	84	42	42

4- Teaching and Learning Methods

- 4.1- Lectures
- 4.2- Exercises and tutorials
- 4.3- Research assignments

5- Student Assessment Methods

5-a Methods

- 5.a1- Reports, assignments, exercises, and final written exam to assess knowledge and understanding.
- 5.a2- Regular oral , written quizzes to assess intellectual skills.
- 5.a3- Practical projects, final oral exams to assess professional skills.
- 5.a4- Reports, assignments, and discussions to assess general and transferable skills

5-b Assessment Schedule

Assessment 1	7 th week.
Assessment 2	16 th week (<i>Oral</i>)
Assessment 3	17 th -18 th weeks (<i>final written exam</i>).

5-c Weighting of assessments

Reports, practical projects,	10%
-------------------------------------	-----

assignments, punctuality and individual class activity	
Mid-Term Examination	10%
Final oral exams	10%
Final written exam	70%
Total	100%

6- List of References

6-a Course Notes

None

6-b Essential Books (Text Books)

[1] Efraim Turban and Jay E. Aronson “Decision Support Systems and Intelligent Systems”, Prentice Hall, 1998

6-c Recommended Books

[1] Cornelius T. Leondes "Knowledge-Base System" K-Theoy 2000 Academic Press.

[2] John V. Richardson "Knowledge Based System for General Reference ", 1995

6-d Periodicals, Web Sites, ... etc

IEEE transactions on computers, software, Expert systems

7- Facilities Required for Teaching and Learning

- PC laboratory.
- Datashow, screen, and laptop computer

Course coordinator:

Dr. Ashraf Elsis

Head of Department:

Prof. Nabil Abd El-Wahed Ismail

Date: / /