

Course Specifications

(4201Expert System)

Faculty: HICIT

Programme(s) Title: Computer Science

Department Title: Computer Science

Academic year / Level: 4thYear – 2ndSemester

Main/Secondary: Main

Date of specification approval: 22/2/2016

A- Basic Information

Title :Expert System**Code:**4201

Weekly Hours:

Lecture: 3**Exercise:** - **Practical:**3 **Total:**6

B- Professional Information

1-Overall aims of course

This course introduces students to expert systems in general and to rule-based systems in specific. Students learn how to build a rule-based expert system in a variety of application areas. They also learn advanced programming techniques which include topics of inexact reasoning, intelligent database management methods, and how to develop a community of expert systems which cooperate over a blackboard structure. Students are also given the opportunity to demonstrate their understanding of the technology by building a rule-based expert system that addresses a real-world problem. The course prepares students for graduate research in the area of expert systems.

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, b3, b4, b5, b10	c1, c5, c6	d5, d11, d12

3- Intended learning outcomes of course (ILOs)

a- Knowledge and understanding.

a1- Understand the fundamental principles of expert systems.

a2- Explain the skills required for building expert systems in different domains.

b-Intellectual skills.

b1. Construct different expert systems using an expert system shell and prolog.

b2. Apply inexact reasoning for calculating different applications in rule based expert systems to obtain a high intellectual skills.

c-Professional and practical skills.

c1. Design and implement rule-based expert systems, semantic networks, frames in prolog.

c2. Design and implement rule-based expert systems using an expert system shell.

d- General and transferable skills

- d1. write a technical report.
- d2 work with a team to implement a network programs

4 -Contents

Topic	Hours	Lecture	Practical
Overview of expert systems	6	3	3
Review of knowledge representation	6	3	3
Review of inference techniques	6	3	3
Introduction to rule-based expert systems	6	3	3
Implementing rule-based ESs, Semantic Nets, Frames in prolog	6	3	3
Case-based reasoning	6	3	3
inexact reasoning	6	3	3
inexact classification	6	3	3
Knowledge acquisition	6	3	3
Knowledge elicitation, extraction	12	6	6
Applying the above concepts on different ES domains	6	3	3
Course Project	6	3	3

5-Teaching and learning methods

- 5.1 Lectures
- 5.2 Tutorial Exercises
- 5.3 Practical Lab
- 5.4 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)

- Introduction to Expert Systems (3rd Edition) (Hardcover) by Peter Jackson
- Expert Systems by Nikolopoulos Chris

8- Required Facilities

- MS Project SW Package for scheduling projects
- Exscurved Shell.

9- Course Matrices

9.1-Course Content/ILOs Matrix

Course Contents	a1	a2	b1	b2	c1	c2	d1	d2
Overview of expert systems	x							
Review of knowledge representation	x	x						
Review of inference techniques	x	x						
Introduction to rule-based expert systems	x	x	x	x				
Implementing rule-based ESs, Semantic Nets, Frames in prolog	x	x	x	x	x	x		
Case-based reasoning	x							
inexact reasoning	x	x						
inexact classification	x	x						

Knowledge acquisition	x							
Knowledge elicitation, extraction	x							
Applying the above concepts on different ES domains	x	x	x	x	x	x		
Course Project							x	x

9.2-Learning Methods /ILOs Matrix

Learning Methods	a1	a2	b1	b2	c1	d1	d2
Lectures	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	b1	b2	c1	d1	d2
Mid Term Exam	x	X	x	x	x		
Final Exam	x	X	x	x	x		
Course Project	x	X	x	x	x	x	x
Course Work &Quizzes	x	X	x	x	x	x	x
Practical Exam	x	X	x	x	x		

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