



Course Specifications

Institution:	College of Science at Az Zulfi
Academic Department :	Computer Science and Information
Programme :	B.Sc.
Course :	Computer Science and Information
Course Coordinator :	Dr. Khalid Nazim Sattar Abdul
Programme Coordinator :	Dr. Yosry A Azzam
Course Specification Approved Date :	22/ 12 / 1435 H



A. Course Identification and General Information

1 - Course title :	Expert Systems	Course Code: CSI 443
2. Credit hours :	3 credit hours (2Lec. +2 Lab.)	
3 - Program(s) in which the course is offered:	Computer Science & Information	
4 – Course Language :	English	
5 - Name of faculty member responsible for the course:	Dr. Khalid Nazim Sattar Abdul	
6 - Level/year at which this course is offered :	Elective Course/ 2014-15	
7 - Pre-requisites for this course (if any) :	CSI 411: Artificial Intelligence	
8 - Co-requisites for this course (if any) :	N/A	
9 - Location if not on main campus :	College of Science at Az Zulfi	
10 - Mode of Instruction (mark all that apply)		
A - Traditional classroom	<input checked="" type="checkbox"/>	What percentage? 80 %
B - Blended (traditional and online)	<input checked="" type="checkbox"/>	What percentage? 10 %
D - e-learning	<input checked="" type="checkbox"/>	What percentage? 10 %
E - Correspondence	<input type="checkbox"/>	What percentage? %
F - Other	<input type="checkbox"/>	What percentage? %
Comments :		

B Objectives

What is the main purpose for this course?

The main objective of the course is to prepare the students a scope for graduate research/ projects in the area of expert systems, in addition

1. Background information about Artificial Intelligence in respect to Expert Systems.
2. History of the research area.
3. Students learn how to build a rule-based expert system in a variety of application areas.
4. Ability to identify and understand the problem space, to determine appropriateness of Expert Systems to a given problem.
5. The role of Expert Systems in our society and its effect on daily lives.



Briefly describe any plans for developing and improving the course that are being implemented :

1. Using group discussion through the internet with course attending students.
2. To make use of the web resources towards understanding several analytical models that support Expert Systems Technology.

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
1. Introduction to Expert Systems	1	4
2. Foundations of Mathematical Logic and Automated Reasoning	1	4
3. Syntax and Semantics of PROLOG Programs	1	4
4. Object Representation with Trees and Lists in PROLOG	2	8
5. Backtracking and Cut , PROLOG Built-In Predicates and Input/Output	1	4
6. PROLOG Applications: Representing sets, searching graphs, symbolic reasoning, etc.	2	8
7. Classical Expert Systems	1	4
8. Rule-Based Reasoning: Forward and Backward Chaining	2	8
9. Knowledge Representation: Semantic Networks, Frames, and the Object-Oriented Paradigm	1	4
10. Uncertainty Management: Bayesian Updating, Certainty Factors, Dempster-Shafer Calculus, and Fuzzy Logic	1	4
11. Knowledge-Based System Lifecycle, Feasibility Analysis, Requirements Specification, and Design	1	4
12. Second-Generation Expert System Architecture	1	4



2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30		30	-	-	60
Credit	30		15	-	-	45

3. Additional private study/learning hours expected for students per week.

5

The private self-study of the student is crucial and shall include the following parameters:

1. To understand the fundamental terms, concepts and theories associated with Artificial intelligence, expert systems and associated tools.
2. To evaluate example based expert system specific to domain of application.
3. To discuss and develop skills in the analysis, design and implementation of real time based expert systems.
4. To frequently have subject based interactions from the course contents with the instructor during specified office hours as per the schedule.

The total workload of the student in this course is then: $60 + 5 * 15 = 135$ work hours



4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	To be able to understand knowledge representation, common knowledge representation paradigms and the issues involved in knowledge representation (e.g. knowledge based systems, ontology and decision support system)	Lectures, Group discussion on different Case studies, Individual presentations on different topics	Term Exams, home works, presentations & reports are used to assess the acquired knowledge on the subject.
1.2	To be familiarize with different AI – expert system Tools & an awareness of the issues involved in building such systems.		
1.3	To understand the types of systems that can be built using expert system techniques, in particular knowledge based systems, rule-based expert systems and ontology based systems.		
2.0	Cognitive Skills		
2.1	Attempt to understand the issues involved in building the expert systems.	Lectures Individual presentations & Brainstorming exercises	Home works, presentations & small program implementations.
2.2	Should be able to analyze practical cases from real life scenario and map them to feasible solutions with more productivity.		
2.3	Should be able to understand the foundation of expert system techniques and logic, particularly as related to knowledge representation and decision support system..		
3.0	Interpersonal Skills & Responsibility		
3.1	Punctual attendance of classes is required of the students.	Small group discussions With Brainstorming Presentations	Presentations & Case Study on a specific TOOL and its advantages
3.2	Students are encouraged to learn new innovations in expert systems technology.		





4.0 Communication, Information Technology, Numerical			
4.1	Ability of students to work within a team/ group and Understand the theoretical concepts in order to develop small applications in real life scenario.	Brainstorming Presentations	Term Exams, and assignments. Evaluation of Technical written reports & presentations

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	First written mid-term exam	6	15%
2	Second written mid-term exam	12	15%
3	Presentation, class activities, and group discussion	Every week	10%
4	Homework assignments	After Every chapter	10%
5	Practical exam	15	10%
6	Final written exam	16	40%
7	Total		100%

D. Student Academic Counseling and Support

Office hours: Sun: 10-12, Wed: 10-12.
Email: k.sattar@mu.edu.sa





E. Learning Resources

1. List Required Textbooks : Expert Systems -- Principles and Programming, J. Giarratano and G. Riley, PWS Publishing Company, 2004.
2. List Essential References Materials : <ul style="list-style-type: none">• Introduction To Expert Systems, Peter Jackson, Addison-Wesley, 1998.
3. List Recommended Textbooks and Reference Material : NONE
5. List Electronic Materials : Determines as the course is going on
5. Other learning material : Video and presentation are as available with me.

F. Facilities Required

1. Accommodation <ul style="list-style-type: none">• Classrooms with required digital aids and to support traditional method of teaching using blackboard.• Classrooms with proper lighting and air conditioning system integrated with the sound system/audio system.• Classroom with smart board interface, display screen and a computer to aid the sessions.
2. Computing resources <ul style="list-style-type: none">• Smart Board with supporting software / computers with updated versions of software as required to understand the subject concepts.
3. Other resources <ul style="list-style-type: none">• NONE

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching: <ul style="list-style-type: none">• Performance of students in the exam and their results.• Regular observation and involvement of students during class sessions.• Analysis of questionnaire as filled by the students to grade their subject knowledge.
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2 Other Strategies for Evaluation of Teaching by the Program/Department

Instructor :

- Periodic review of course (the Commission of study plans).
- External evaluation.
- Faculty assessment of the course and effectiveness of teaching delivery.
- Periodic self- assessment of the program.

3 Processes for Improvement of Teaching :

- Revision of course contents, course specifications, and strategies every 5 years.
- Encouragement to the faculty to take up workshops, participate in subject oriented research Works.
- Committee will review deficiencies based on the student evaluation, faculty input, course file, and program assessment.
- Feedback from employers and alumni surveys and graduating students' input are used to identify any deficiencies in students' ability in applying knowledge .
- Teaching method will focus on students' learning and on course learning outcomes.

4. Processes for Verifying Standards of Student Achievement

- Academic Committee will review samples of student work in this course to check on the standard of grades and achievements.
- Periodic exchange and remarking of a sample of assignments with a member of staff in another institution.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :

- Self- assessment at periodic level and the external assessment by the invited faculty member at stipulated time will be carried out. The feedback received from these assessments will be used to plan for further improvement in the course syllabus, teaching method, and delivery of course materials.
- Comparison of the course to its counterparts offered in similar departments in terms of the depth of the subject contents.
- Encouraging the students to express their opinions about the subject knowledge and further scope of improvement(s).
- To update the contents on a timely basis, so as to meet the demands in the external environment and make the students comfortable in their domain of interest.





Course Specification Approved
Department Official Meeting No (6) Date 22 / 12 / 1435 H

Course's Coordinator

Name: Dr. Khalid Nazim Sattar Abdul

Signature :

Date : 22/ 12 / 1435H

Department Head

Name: Dr. Yosry A Azzam

Signature :

Date : 22/ 12 / 1435H

