



Course Specification

— (Bachelor)

Course Title: **Experts Systems**

Course Code: **501585-3**

Program: **Bachelor in Computer Science**

Department: **Computer Science Department**

College: **Al Khurmah University College**

Institution: **Taif University**

Version: **1**

Last Revision Date: **01-02-2024**



Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods	4
C. Course Content	5
D. Students Assessment Activities	6
E. Learning Resources and Facilities	6
F. Assessment of Course Quality	7
G. Specification Approval	8



A. General information about the course:

1. Course Identification

1. Credit hours: (3)

2. Course type

A. University College Department Track Others
 B. Required Elective

3. Level/year at which this course is offered: (8th Level /4)

4. Course general Description:

This course introduces the principles of design, development and operations of expert systems. Topics will include different methods of knowledge representation and knowledge engineering techniques. Inference techniques, uncertainty handling, and the basics of computer programming for Expert Systems. Principles of Fuzzy Logic is covered as an approximate reasoning technique. Some Machine Learning techniques such Artificial Neural networks and Association Rule Learning are introduced as recent trend in the field. Practical considerations of applying knowledge-based Systems in different applications are discussed.

5. Pre-requirements for this course (if any):

501481-3

6. Co-requirements for this course (if any):

Null

7. Course Main Objective(s):

Students at the end of this course are able to:

- Recognize the components of an expert system and understand the relation among these components.
- Investigate the main knowledge base systems' models and their applications.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
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No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	2	67%
2	E-learning	1	33%
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Understand basic components of expert system	K1	Lectures Labs	Direct Quizzes / Homework Exams Indirect Course Exit Survey
2.0	Skills			
2.1	Use different knowledge representation and knowledge engineering techniques	S1	Lectures Homework Project	Direct Quizzes / Homework Exams Indirect Course Exit Survey





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.2	Use different reasoning techniques and handle uncertainty	S1	Lectures Homework Project	Direct Quizzes / Homework Exams Indirect Course Exit Survey
2.3	Evaluate practical considerations of applying knowledge based Systems in different Machine Learning applications	S2	Lectures Homework Project	Direct Quizzes / Homework Exams Indirect Course Exit Survey
3.0	Values, autonomy, and responsibility			
...				

C. Course Content

No	List of Topics	Contact Hours
1	An overview of Expert System	3
2	Knowledge Representation & Engineering	6
3	Computer Programming for Expert Systems	6
4	Inference Techniques: Forward Chaining Backward Chaining & CBR	3
4	Reasoning Under Uncertainty: Certainty Factors & Bayes Theorem	6
5	Approximate Reasoning: Fuzzy Logic	3
6	Machine Learning Approaches: Artificial Neural Networks	6
7	Machine Learning Approaches: Association Rule Learning	6
8	Practical Applications & Project Presentations	6
Total		45



D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1	Student Participation/Attendance	Every Week	5%
2	Project/Home work	Week 3 →14	15%
3	Quizzes	Week 4 & 12	10%
4	Midterm Exam	Week 15	20%
5	Final Exam	Week 16	50%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	The Essence of Expert Systems, K. Darlington, Pearson, 2011
Supportive References	Principles of Expert Systems, P. Lucas, Addison Wesley, 2014
Electronic Materials	TBA during the course
Other Learning Materials	TBA during the course

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	A Lecture room appropriate for maximum 25 students with a personal computer, a data show and a smart board.
Technology equipment (projector, smart board, software)	Video projector / data show
Other equipment (depending on the nature of the specialty)	



F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	<ul style="list-style-type: none"> Students Faculty members Coordinator Council Curriculum Committees 	<ul style="list-style-type: none"> Course exit survey Feedback from Faculty members Feedback from Course Coordinator Feedback from council Feedback from Curriculum Committees
Effectiveness of Students assessment	<ul style="list-style-type: none"> Students Faculty members Coordinator Council Curriculum Committees 	<ul style="list-style-type: none"> Course exit survey Feedback from Faculty members Feedback from Course Coordinator Feedback from council Feedback from Curriculum Committees
Quality of learning resources	<ul style="list-style-type: none"> Students Faculty members Coordinator Council Curriculum Committees 	<ul style="list-style-type: none"> Course exit survey Feedback from Faculty members Feedback from Course Coordinator Feedback from council Feedback from Curriculum Committees
The extent to which CLOs have been achieved	<ul style="list-style-type: none"> Students Faculty members Coordinator Council Curriculum Committees 	<ul style="list-style-type: none"> Course exit survey Feedback from Faculty members Feedback from Course Coordinator Feedback from council Feedback from Curriculum Committees
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)





G. Specification Approval

COUNCIL /COMMITTEE	CS council
REFERENCE NO.	Meeting #11
DATE	07/03/2024

