Course Specifications

Course Title:	**Expert Systems**
Course Code:	**AI 326**
Program:	**Information and Computer Science**
Department:	**Computer Science and Information**
College:	**College of Science at Az Zulfi**
Institution:	**Al- Majmaah University**

Table of Contents

A. Course Identification

1. Credit hours:	3 Cr(2 Lec +2 lab)
2. Course type	
a.	University ☐ College ☐ Department ■ Others ☐
b.	Required ■ Elective ☐
3. Level/year at which this course is offered:	
4. Pre-requisites for this course (if any)**:**	AI 323 - Logic Programming and Symbolic Computation
5. Co-requisites for this course (if any)**:**	NIL

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	✔	80 %
2	**Blended**	✔	5 %
3	**E-learning**	✔	5 %
4	**Correspondence**	✔	5 %
5	**Other**	✔	5 %

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	30
2	**Laboratory/Studio**	30
3	**Tutorial**	--
4	**Others** (specify)	--
	Total	60
Other Learning Hours*		
1	**Study**	45
2	**Assignments**	10
3	**Library**	05
4	**Projects/Research Essays/Theses**	15
5	**Others** (specify)	--
	Total	(60+75 = 135)

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

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 expert systems.

2. Course Main Objective

The course gives students knowledge and skills for solving medium to hard problems from diverse expert systems application domains. Students will be knowledgeable about the tools and the processes used for the creation of an expert system. This course will also enable the students to conduct an in-depth examination of an existing expert system with an emphasis on basic methods of creating a knowledge base.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge:**	
1.1	Understand current of advanced AI technologies that enable machines to sense, comprehend, act and learn on their own.	K3-AI
2	**Skills :**	
2.1	Design, implement and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.	**S3- AI**
2.2	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.	
3	**Competence:**	
3.1	Empower scientific abilities to implement AI techniques with stakeholders to define their scopes, limitations, and social impacts.	**C3-AI**

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Expert Systems + The Representation of Knowledge	12
2	Methods of Inference	12
3	Reasoning under Uncertainty, Inexact Reasoning	12
4	Design of Expert Systems, Introduction to CLIPS.	12
5	Advanced Pattern Matching Field.	12
Total		60

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
1.1	Understand current of advanced AI technologies that enable machines to sense, comprehend, act and learn on their own.	Lectures Lab demonstrations Case studies Individual presentations	Written Exam Homework assignments Class & lab Activities Quizzes
2.0	**Skills**		
2.1	Design, implement and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.	Group discussions, Brainstorming Presentations	HomeWorks and assignments
2.2	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning..		
3.0	**Competence**		
3.1	Empower scientific abilities to implement AI techniques with stakeholders to define their scopes, limitations, and social impacts.	Group discussions Case Studies Brainstorming Presentations	Lab Activities, Project report evaluation

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	First written mid-term exam	6	20%
2	Second written mid-term exam	12	20%
3	Class activities, group discussions, Seminars, Project Presentations.	Every week	10%
4	Homework + Assignments	After every chapter	10%
5	Final written exam	16	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
Office hours:
Email: @mu.edu.sa

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Artificial Intelligence and Expert System, Gupta, and G. Nagpals Mercury Learning & information 2020
Essential References Materials	Peter Jackson, Introduction to Expert Systems, Addison-Wesley Pub (Sd), Addison-Wesley Pub (Sd), 2nd edition, ISBN-10 : 0201175789, ISBN-13 : 978-0201175783
Electronic Materials	1.https://nptel.ac.in/content/storage2/courses/126104006/LectureNotes/Week-3_Expert%20Systems.pdf
Other Learning Materials	**Course material includes handouts, ppt, questionnaires as distributed among the students**

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	1. Classrooms with required digital aids and to support traditional method of teaching using blackboard. 2. Classrooms with proper lighting and air conditioning system integrated with the sound System /audio system. 3. Classroom with smart board interface, display screen and a computer to aid the sessions
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board with supporting software / computers with updated versions of software as required to understand the subject concepts with quality headphones.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	NIL

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	Students Classroom Observation Committee Professional Development Unit External Reviewers – accreditation committee	Formal Classroom Observation - Direct Student Surveys - Indirect
Effectiveness of Assessment	Curriculum and Test Development Unit Curriculum Committee Assessment Committee External Reviewers	Faculty Feedback - indirect Student Feedback – indirect Course Reports

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Extent of Achievement of Course Learning Outcomes	Quality Assurance Unit Curriculum and Test Development Unit	Course Reports Annual Program Review

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	