Kingdom of Saudi Arabia
Ministry of Higher Education
College of Computer & Information Sciences
Majmaah University

College of Computer
and Information Sciences
كلية علوم الحاسب والمعلومات

جامعة المجمعة
Majmaah University

Course Profile

Course Name:-	Neural Network and Fuzzy Logic
Course Code:-	CEN 426
Academic Year:-	1434-1435
Semester:-	Spring

Course Overview

This course introduces to undergraduate students the fundamentals, computing, design, and application of Artificial Neural Network (ANN).

Types of ANN based on input layer, hidden layer and output layer.

The classification of the ANNs based on their application.

The basics of Fuzzy Logic (FL) such as fuzzy set, membership function, fuzzification and defuzzification.

The design of fuzzy logic and a fuzzy controller model.

The explanation of different FL model types and their applications.

The fundamentals of computing, design, and application of Neuro-Fuzzy system.

The comparison between neuro-fuzzy and ANN system

Course Details

Level:-	10
Credit:-	3(2,2,0)
Pre-Requisites:-	CEN 323
Co- Requisites:-	N/A

Learning Outcomes of Course

The student is expected to be able to:

1. Understand the concept of ANN, FL, and Neuro-fuzzy.
2. Be familiar with modeling ANN, FL, and Neuro-fuzzy systems using different types of data.
3. Understand the distinction between the applications of ANN, FL, and Neuro-fuzzy systems.
4. Understand the distinction between the advantages and disadvantages of ANN, FL, and Neuro-fuzzy systems.

Course Assessment

Name of Assessment Task	Weight of Assessment	Week Due
1. Midterm Exam-1	15%	Week 8
2. Midterm Exam-2	15%	Week 13
3. LAB	20%	
4. Assignments/Report/Seminar	10%	
5. Final Exam	40%	Week16

Assessment Task and Learning Outcomes Alignment

Assessment Task Name	Course Learning Outcomes			
	1	2	3	4
1. Midterm Exam-1	√	√		
2. Midterm Exam-2	√	√	√	
3. LAB	√	√	√	√
4. Assignments/Report/Seminar	√	√	√	√
5. Final Exam	√	√	√	√

Teaching Contact Details

Name of Course Coordinator:-	Eyad Haj Said
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Lab/Tutorial Instructor:-	Yazan Otoum
Email of Lab/Tutorial Instructor:-	y.otoum@mu.edu.sa
Office Hours:-	Sun: 9:00am – 12:00pm, or by appointment
Office Number:-	24-1-14-3
Office Phone Number:-	16 4042597

Details of Required Text Book

Book Name	Authors Name	Publisher	Year	Edition
Fuzzy Logic with Engineering Applications	Timothy Ross	Wiley	2010	3rd Edition

Details of Required Reference Books

Book Name	Authors Name	Publisher	Year	Edition
Control and Dynamic Systems (Neural Network Systems Techniques and Applications	Cornelius T. Leondes	Academic Press	1997	

IT Resources

You will need access to the following IT resources:

- MU University Student Email
- Internet
- Course Website
- Matlab

Course Schedule

Course Topics	Book's Chapter	Event Name	Week Due
Introduction to Fuzzy Logic Systems	Chapter 1-2		Week 1
Basic Concepts in Fuzzy Logic : fuzzy set, membership function, Fuzzy relations	Chapter 3-4	Assigement1	Week 2-3
Fuzzification and Defuzzification.	Chapter 4		Week 4-5
Designing of Fuzzy System Controller and FL models	Chapter 5	Midterm-1 Assignment 2	Week 6-7
Introduction to Neural Networks and its Applications			Week 8
Basic learning algorithms: delta learning rule, the back propagation algorithm, self-organization learning		Assignment 3	Week 9-10
Multilayer neural networks and back-propagation		Assignment 4	Week 11-12

Self-organizing neural networks		Midterm-2 (Week 13)	Week 13-14
Neuro-Fuzzy systems			Week 15
Introduction to Fuzzy Logic Systems		Final Exam	Week 16

Referencing Style

American Psychological Association (APA)

Course Assessment Task

Assessment Name:-	Midterm Exam-1
Description of Task Assessment:-	This assignment is aligned to learning outcomes 1, 2 and 3. In that regard, the assignment contains questions that assess: 1. Understanding the concept of ANN, FL, and Neuro-fuzzy. 2. To be familiar with modeling ANN, FL, and Neuro-fuzzy systems using different types of data.
Task Assessment Due Week/Date:-	**Week 8**
Return Week/Date to Students:-	Week 9
Weight of Task Assessment:-	15%
List of Learning Outcomes Assessed:-	1. Understanding the concept of ANN, FL, and Neuro-fuzzy. 2. To be familiar with modeling ANN, FL, and Neuro-fuzzy systems using different types of data.

Assessment Name:-	Midterm Exam-2
Description of Task Assessment:-	This assignment is aligned to learning outcomes 1, 2, and 3. In that regard, the assignment contains questions that assess: 1. Understanding the concept of ANN, FL, and Neuro-fuzzy. 2. To be familiar with modeling ANN, FL, and Neuro-fuzzy systems using different types of data. 3. The distinction between the applications of ANN, FL, and Neuro-fuzzy systems.

Task Assessment Due Week/Date:-	**Week 13**
Return Week/Date to Students:-	Week 14
Weight of Task Assessment:-	15%
List of Learning Outcomes Assessed:-	1. Understanding the concept of ANN, FL, and Neuro-fuzzy. 2. To be familiar with modeling ANN, FL, and Neuro-fuzzy systems using different types of data. 3. The distinction between the applications of ANN, FL, and Neuro-fuzzy systems.

Assessment Name:-	Final Exam
Weight of Task Assessment:-	**40%**
Duration:-	**180 Minutes**
Warning:-	Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments) Calculator Permitted Closed Books
List of Learning Outcomes Assessed:-	1. Understanding the concept of ANN, FL, and Neuro-fuzzy. 2. To be familiar with modeling ANN, FL, and Neuro-fuzzy systems using different types of data. 3. The distinction between the applications of ANN, FL, and Neuro-fuzzy systems. 4. The distinction between the advantages and disadvantages of ANN, FL, and Neuro-fuzzy systems.