Republic of Iraq
The Ministry of Higher Education
& Scientific Research

University: Kufa
College: Education for Girls
Department: Computers
Stage: 4st
Academic Status: Intelligent Applications
Qualification:Computer sciences Msc
Place of work: Najaf

Course Syllabus

Course Instructor	**Zahraa Mohammed Ali Hatem**
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Title	**Assist Lecturer**
Course Description	An Introduction to Neural Network, Perceptron Neural Net, Back Propagation Neural Net, Hopfield Neural Net, Bidirectional Associative Memory Neural Net, Case Study in NN, An Introduction to Genetic Algorithms, GA in Travelling Sales Man Problem Solving, Business Applications of GA, An Introduction to Genetic Programming.
Course Objective	
Textbook	
References	1. Laurene Fausett, Fundamantals of neural Networks: Architecture, Algorithms, and Applications, 1994. 2. David E. Goldberg, Genetic Algorithms in Search optimization, and Machine Learning, 1993. 3. Neural Networks. Fundamentals, Application and Examples. By Werner Kinnebrock. 4. Neural Network for Identification, Prediction and Control. By D. T. Pham and X. Liu.

Course Assessment	Tests	Laboratory	Quizzes	Project	Assignments	
					Team	individual
	50%	20%	5%	5%	10%	10%

General Notes	

Intelligent Applications
Course weekly Outline

Week	Topics Covered	Lab. Experiment Assignments
1	An Introduction to Neural Network	Define Functions in C++
2	Perceptron Neural Net and Basic Activation Functions	Defining Activation Functions in C++
3	Hebbian Learning Rule	Defining Hebbian Learning Rule in C++
4	Basic Delta Rule (BDR)	Defining Hebbian Learning Rule in C++
5	Applied Examples	Defining Hebbian Learning Rule in C++
6	Back Propagation Neural Net	Defining Hebbian Learning Rule in C++
7	Back Propagation Training Algorithm	Back Propagation Training Algorithm in C++
8	Applied Examples	Back Propagation Training Algorithm in C++
9	Hopfield Neural Net	Back Propagation Training Algorithm in C++
10	Applied Examples	Back Propagation Training Algorithm in C++
11	Bidirectional Associative Memory (BAM)	Hopfield Neural Net in C++
12	Applied Examples	Hopfield Neural Net in C++
13	Case Study in NN	Hopfield Neural Net in C++
14	Applied Examples	Hopfield Neural Net in C++
15	Test	Test
Mid – year Break		
16	An Introduction to Genetic Algorithms	Define Record in C++
17	How do Genetic Algorithms Work	Define Record in C++
18	Initial Population in GA	Using Random function
19	Calculate Fitness Function	Defining Initial Population in GA
20	GA operator	Defining Initial Population in GA
21	Applied Examples	Defining Initial Population in GA
22	GA operator	Calculating Fitness Function in C++
23	GA operator	Calculating Fitness Function in C++
24	Applied Examples	Selection operator in C++
25	GA in Travelling Sales Man Problem Solving	Selection operator in C++
26	Applied Examples	Crossover operator in C++
27	Business Applications of GA	Crossover operator in C++
28	An Introduction to Genetic Programming	Mutation operator in C++
29	Applied Examples	Mutation operator in C++
30	Final Test	Final Test

Intelligence Applications:

An Introduction to Neural Network, Perceptron Neural Net, Back Propagation Neural Net, Hopfield Neural Net, Bidirectional Associative Memory Neural Net, Case Study in NN, An Introduction to Genetic Algorithms, GA in Travelling Sales Man Problem Solving, Business Applications of GA, An Introduction to Genetic Programming.

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