Philadelphia University
Faculty of Engineering
Department of Computer Engineering
First Semester, 2010/2011

Course Syllabus

Course Title: ARTIFICIAL NEURAL NETWORKS & FUZZY LOGIC	**Course code: 630551**
Course Level: 5th Year	**Course prerequisite(s): 630204**
Class Time:9:10 -10:10 Sun,Tue,Thu	**Credit hours: 3**

Academic Staff Specifics

Name	Rank	Office No.	Office Hours	E-mail Address
Dr. Mohammed Mahdi Ali	**Assistant Prof**	**716**	**12:10-13:00 Weekly**	**M_selman@philadelphia.edu.jo**

Course description:

Basic introduction to **NEURAL NETWORKS & FUZZY LOGIC**, development and implementation. It includes; Neural versus conventional computing. Learning processes. The preceptor. The backpropagation learning algorithm. Recurrent networks. Self-organization Feature maps. Applications. Introduction to Fuzzy theory. Fuzzy Logic. Fuzzy logic in engineering.

Course objectives:

   The main objective of this course is to provide the student with the basic understanding of neural networks and fuzzy logic fundamentals , Program the related algorithms and Design the required and related systems

Course components

- **Books (title , author (s), publisher, year of publication)**

  Neural Networks:A Comprehensive Study By:Simon Hyken. Macmillan Colledge Publishing Company, Inc.1996 Fuzzy Control and Fuzzy System. By: Witold Pedrycz.Research Studies Press Ltd.2ndd edition 1996.
- **D Support material (s) (vcs, acs, etc).**
- **Study guide (s) (if applicable)**
- **Homework and laboratory guide (s) if (applicable).**

Teaching methods:

Lectures, discussion groups, tutorials, problem solving, debates, etc.

Learning outcomes: upon completing this course, the student should have: -

- Knowledge and understanding: Understanding principles of neural networks and fuzzy logic fundamentals; Design the required and related systems .

- Cognitive skills (thinking and analysis).

- Communication skills (personal and academic).

- Practical and subject specific skills (Transferable Skills).

Course Intended Learning Outcomes									
A - Knowledge and Understanding									
A1.	A2.	A3.	A4.	A5.	A6.	A7.	A8.		
■	■	■			■	■	■		
B - Intellectual Skills									
B1.	B2.	B3.	B4.	B5.	B6.	B7.	B8.	B9.	
	■	■	■		■			■	
C - Practical Skills									
C1.	C2.	C3.	C4.	C5.	C6.	C7.	C8.	C9.	C10.
■	■				■	■		■	■
D - Transferable Skills									
D1.	D2.	D3.	D4.	D5.	D6.	D7.			
	■	■		■		■			

Assessment instruments

- **Short reports and presentations**: Reading related to current topic will be assigned every week. Assignments and other Homework (HW) will be given throughout the semester, focusing on the concepts learned from these readings.
- **Quizzes:** TWO to THREE Quizzes will be offered (dates TBD).
- **Project:** Project is an essential part of this course. Assessment will be based on 3 phases: System Specification, System Design, Hardware and Software Implementation with Project Demonstration. Detailed topics and schedule will be announced in due course.
- **Final examination**: 50 marks

Allocation of Marks	
Assessment Instruments	**Mark**
1st examination	**15 %**
2nd examination	**15 %**
Project , Presentation, Quizzes and Homework,	**20 %**
Final Examination:	**50 %**
Total	**100 %**

Documentation and academic honesty

- Documentation style (with illustrative examples)
- Protection by copyright
- Avoiding plagiarism.
- **Ethics and Disability Act:**
    - Students may consult with one another on solutions, but copying another student's code is strictly prohibited.
    - Students should write their own code. Using code found on books or internet is prohibited.
    - The Instructor follows general university "Academic Dishonesty/Cheating Policy".

Course academic calendar

week	Basic and support material to be covered	Homework/reports and their due dates
(1)	CONCEPTS OF ANN'S.	
(2)	KINDS OF ANN'S.	
(3)	MULTI LAYER ANN'S: TOPOLOGY AND C/CS	
(4)		HW1
(5)	EBP LEARNING ALGORITHM.	
(6)		
(7)	RECURRENT ANN'S.	HW2
(8) **Mid Exam**	ANN'S APPLICATIONS.	
(9)	CONCEPTS OF FUZZY LOGIC.	Project Selection
(10)	BASIC ELEMENTS OF FUZZY SYSTEM	HW3
(11)	UNIVERSE OF DISCOURSE AND FUZZY SETS DEFINITIONS	Project (Phase1)
(12)		
(13)	FUZZY PRODUCTION RULES (FPR's) & FUZZY ALGORITHM	
(14)		
(15) **Specimen Exam (Optional)**	FUZZY APPLICATIONS	Project (Phase2)
(16) **Final Exam**	AN INTRODUCTION TO NEUROFUZZY SYSTEM.	

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute class/tutorial.

Attendance policy:

Absence from classes and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

The student is responsible for all assignments on a weekly basis.
No make-up will be given for missed quizzes, tests or assignments, unless a case is made in advance with Instructor's approval.

Course references

Books

1- Dan W. Patterson,"Artificial Neural Networks:Theory and Applications",Prentice all 1996.
2- V Valluru Rao and Hayagriva Rao,"C++Neural and Fuzzy Logic", New Delhi, BPB Publication 2nd edition, 1996.
3- Understanding Neural Networks and Fuzzy Logic: Basic Concepts and Applications, New York 1996.

Journals

Websites