Course Outline

Course Name: Neural Networks (0306483)
Prerequisite Course Name: Algorithms Design and Analysis (0306352)
Lecturer Name: Salah F. Saleh.
Lecturer Office Number: 217D
Lecture Time: 11:00 – 12:30   (Mon, Wed)
Office Hours: 12:30-1:30 (Mon, Wed)

Intended Learning Outcomes (ILOs):

 Student will acquire the skills of:
- Understand one application of the artificial intelligence.
- Understand and implement the neural network principles.
- Analyzing problem and writing algorithms to design a neural Network.

Contents Outline:

Subject	Hours

1. Introduction
   1.1. Artificial Neural Networks.
   1.2. Biological Neural Networks.
   1.3. Applications of Neural Networks.
   1.4. The McCulloch-Pitts Neurons.
	6

2. **Simple Neural Nets for Pattern Classification**
   5.1. General Discussion.
   5.2. Hebb Net.
   5.3. Perceptron.
   5.4. Adaline and Madaline.
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3. **Pattern Association**
   5.1. Training Algorithms for Pattern Association.
   5.2. Hetroassociative Neural Network.
   5.3. Autoassociative Net.
   5.4. Iterative Autoassociative Net.
   5.5. Bidirectional Associative Memory (BAM).
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4. **Neural Networks Based on Competition**
   5.1. Fixed Weight Competitive Nets.
   5.2. Kohonen Self-Organizing Map.
   5.3. Learning Vector Quantization.
   5.4. Counter Propagation.
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Subject	Hours
5. **Backpropagation Neural Net** 5.1. Standard Backpropagation. 5.2. Variations on Backpropagation Neural Net.	6
6. **Adaptive Resonance Theory** 6.1. ART1. 6.2. ART2.	6

Text Book:

Laurene Fausett, "Fundamentals of Neural Networks, Architecture, Algorithms, and Applications", Prentice Hall, 1994.

Useful References:

1. Valluru Rao," Neural Networks and Fuzzy Logic using C++", BPB Pub., 1996.
2. Freeman J.A., "Neural Networks, algorithms, application and programming".

Teaching Methods:

- Lectures
- Lab Assignments.
- Project.

Assessment:

- First Exam   15
- Second Exam   15
- Home works and Quizzes   10
- Project   10
- Final Exam   50

Good Luck