

## Neural Networks

- **Course number and name:**  
CC 524 – Neural Networks
- **Credits and contact hours**  
Credits Hours: 3Hrs  
Contact Hours: In Lecture 2Hrs, and In Tutorial 2Hrs
- **Instructor’s or course coordinator’s name**  
Coordinator Name: Dr. Rowayda Sadek
- **Text book, title, author, and year**
  - Martin T.Hagan, Howard B. Demuth & Mark Beale, Neural Networks:Design, Reprinted, 2002
  - M. T. Hogan, H. Demuth, neural networks design, 1996.
  - MATLAB neural networks toolbox, user guide, 1995.
  - Robert R. Trippi, Efraim Turban, Neural Networks In Finance and Investing, McGraw-Hill, 1996
- **Specific course information**
  - a. **Catalog description**  
Introduction to basic concepts of neural networks. The basic neuron.The multilayer perceptron. Artificial neural networks: applications, learning, and architecture. Competitive neural networks. Kohonen self-organizing networks. Adaptive reasoning theory (ART). Hopfield neural networks. Neural networks implementation. Neural networks applications. Introduction to MATLAB environment. Single perceptron, Multilayer perceptron, Competitive networks, Kohonen networks, ART networks, And Hopfield networks using MATLAB.
  - b. **prerequisites or co-requisites**  
Prerequisites: CC112, BA323
  - c. **Types of Course ( required, elective, or selected elective course) in the program**  
Elective Course
- **Specific goals for the course**
  - a. **Specific outcomes of instruction**  
After the completion of this course the students will be able to:

	Course Learning Outcomes	SO
1	Explain the basic concepts of neural networks.	A,B,C
2	Discuss a wide variety of neural networks with architecture, training, algorithms, and applications.	B,C,E,K
3	Demonstrate the architecture, training, and applications of a wide variety of neural networks using MATLAB simulation package.	B,C,E,K

## Topics to be covered

- Introduction to basic concepts of neural networks.
- The basic neuron and perceptron networks.
- The multilayer perceptron and back-propagation learning.
- Artificial neural networks: applications, learning rules, and architecture
- Competitive neural networks
- Kohonen self-organizing networks
- Hebbain Networks
- Hopfield neural networks
- Hamming networks
- Eigen space and performance surfaces
- Neural networks applications
- Pattern classification Projects