BSc. program, Electrical & Electronic Engineering Department

Course Unit Title	Neural Networks
Course Unit Code	EE 420
Type of Course Unit	Elective Course
Level of Course Unit	First Cycle
National Credits	3
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	4
Practice (hour/week)	-
Laboratory (hour/week)	1
Year of Study	4
Semester when the course unit is delivered	Fall/Spring
Course Coordinator	Assist. Prof. Dr. Kamil Dimililer
Name of Lecturer (s)	Assist. Prof. Dr. Kamil Dimililer
Name of Assistant (s)	Buse Uğur
Mode of Delivery	Face to Face
Language of Instruction	English
Prerequisites	EE 210
Recommended Optional Programme Components	

Course description:

The Neural network paradigm and fundamentals. Training by error minimization. Back propagation algorithms. Feedback and recurrent networks. Hopfield network, Genetic algorithms. Probability and neural networks. Optimizations and constraint.

Objectives of the Course:

- Teaching the basics of neural networks
- To illustrate the basic applications of neural networks using Matlab.
- To give the principles of neural networks approaches

At the end of the course the student should be able to		Assessment
1	Analyze theoretical and practical basics of neural networks	1
2	To write programs for neural networks applications using Matlab	2,5
3	Develop real life applications of neural networks	2,3,5

Assessment Methods: 1. Written Exam, 2. Assignment, 3. Project/Report, 4. Presentation, 5. Lab. Work

Course's Contribution to Program

		CL
1	Ability to understand and apply knowledge of mathematics, science, and engineering	3
2	An ability to analyze a problem, identify and define the computing requirements appropriate to its solution	5
3	An ability to apply mathematical foundations, algorithmic principles, and computer engineering techniques in the modeling and design of computer-based systems	5
4	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social aspects	-
5	Planning and carrying out experiments, as well as to analyze and interpret data	5
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	5
7	An understanding of professional, ethical, legal, security and social issues and responsibilities that apply to engineering.	3
8	An ability to work productively in a multidisciplinary team, in particular to carry out projects involving computer engineering skills.	4
9	An ability to communicate effectively with a range of audiences	1
10	A recognition of the need for, and an ability to engage in life-long learning	5

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Introduction	
2		Fundamentals of Neural Networks	
3		Fundamentals of Neural Networks	
4		Supervised / Unsupervised Learning Algorithms	
5		Supervised / Unsupervised Learning Algorithms	
6		Introduction to Back Propagation Algorithm	
7		Applications of Back Propagation Algorithm	
8			Midterm
9		XOR Problem	
10		Introduction to ADALINE	
11		Practical Application of ADALINE	
12		Hopfield Algorithm	
13		Application of Hopfield Algorithm	
14		Examples, Review of the Semester	
15		Examples, Review of the Semester	
16			Final

Recommended Sources
Textbook:

Fundamentals of Artificial Neural Networks, by Mohamad Hassoun

Lab Manual:
Supplementary Course Material

Assessment

Attendance	-	
Assignments	5%	
Lab	20%	Lab Attendance, Lab Performance, Assignments
Midterm Exam	25%	Written Exam
Final Exam	50%	Written Exam
Total	100%	

Assessment Criteria
Final grades are determined according to the Near East University Academic Regulations for Undergraduate Studies

Course Policies

1. Attendance to the course is necessary but not mandatory.
2. Late assignments will not be accepted unless an agreement is reached with the lecturer.
3. Cell phones and computers must be switched off during the exam.
4. Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Near East University General Student Discipline Regulations.
5. Attacks performed against University/lecturer resources are expressly prohibited.

ECTS allocated based on Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class (including Exam weeks)	16	4	64
Labs and Tutorials	20	1	20
Assignment	2	4	8
Project/Presentation/Report	-	-	-
E-learning activities	-	-	-
Quizzes	-	-	-
Midterm Examination Study	1	10	10
Final Examination Study	1	21	21
Self Study	14	4	56
Total Workload			179
Total Workload/30(h)			5.97
ECTS Credit of the Course			6