EASTERN MEDITERRANEAN UNIVERSITY

SCHOOL OF COMPUTING AND TECHNOLOGY / DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Code	ITEC 460	**Semester**	Spring 2019-2020	**Credit Value**	(3,1,0) 3
Course Title	Introduction to Neural Networks			**ECST Credit**	5
Instructors(s)	Prof. Dr. Ahmet Rizaner			**Prerequisite(s)**	ITEC114
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Course Web	http://staff.emu.edu.tr/ahmetrizaner/en/Pages/ITEC460.aspx				

Course Description

This course is an introduction to neural networks with both theoretical and practical issues being considered. Upon completion of this course, the student should understand the main neural network architectures and learning algorithms and be able to apply neural networks to real classification problems. Topics covered include single layer perceptions, multi-layer perceptions, associative memory networks, discrete hopfield networks, radial basis function networks and self-organizing networks.

General Learning Outcomes

On successful completion of this course students should be able to:

- Describe what a neural network is;
- Describe the relation between real brains and simple artificial neural network models;
- Discuss the main factors involved in achieving good learning and generalization performance in neural network systems;
- Identify the main implementational issues for common neural network systems;
- Evaluate the practical considerations in applying neural networks to real classification problems.

Teaching Methodology / Classroom Procedures

- Each week there are three lecture sessions and one tutorial/lab session.
- Group projects are organized in parallel to theoretical study given in classrooms. A report should be submitted for evaluation for each project.
- Students should form project groups of 3-5 students.
- Students are encouraged to use internet to search for various related topics. Lecture notes, Projects, Related Programs, assignments and announcements will be posted on the course's web site.

Course Materials / Main References

Text Book:

Robert Callan, The Essence of Neural Networks, First Edition, Pearson Prentice Hall, 1999.

Resource Books:

1. Laurene V. Fausett, Fundamentals of Neural Networks: Architecture, Algorithms and Applications, First Edition, Prentice Hall, 1993.
2. Phil Picton, Neural Networks, Second Edition, Palgrave, 2000.
3. Simon Haykin, Neural Networks: A Comprehensive Foundation, Second Edition, Prentice-Hall, 1998.

Lecture Notes:

Most course materials are also available online in Adobe PDF (Portable Document Format). (Passwords for the protected files is cxa1294z)

Weekly Schedule / Summary of Topics	
Week 1	**Introduction** Introducing the basic elements of neural network
Week 2-3	**Single Layer Perceptron** Single-layer perceptron, delta rule, pattern classification task, supervised learning, basic concepts of how feedforward networks.
Week 4-5	**Multi-Layer Perceptron** Multi-layer Perceptron, structure of multi-layer perceptron, feedforward backpropogation network and backpropogation learning rule.
Week 6-7	**Associative Memory Neural Network** Autoassociative networks, heteroassociative networks, pattern association, pattern storing and capacity.
Week 8-9	**Midterm Examinations Week**
Week 10-12	**Discrete Hopfield Network** Fundamental memory, storing, error-correcting capability and common problems arising with the Hopfield networks.
Week 13-14	**Radial Basis Function Networks** Radial basis functions, learning algorithms used in RBF networks and function approximation.
Week 15-17	**Final Examinations Week**

Requirements
▪ Each student can have only one make-up exam. One who misses an exam should provide a medical report or a valid excuse within 3 days after the missed exam. The make-up exam will be done at the end of the term and will cover all the topics. No make-up exam will be given for the quizzes. ▪ Students who do not pass the course and fail to attend the lectures regularly may be given NG grade. ▪ Instructions for the submission of projects will be posted on the course website. It is each student's responsibility to read and follow the instructions. Failure to follow the submission instructions may result in the project receiving a mark of zero.

Method of Assessment				
Evaluation and Grading	**Projects**	**Quizzes**	**Midterm Exam**	**Final Exam**
Percentage	20 %	15 %	25 %	40 %