



T.C.

ESKİŞEHİR OSMANGAZİ ÜNİVERSİTESİ

FACULTY OF SCIENCES

MATHEMATICS AND COMPUTER SCIENCES DEPARTMENT



## COURSE INFORMATION FORM

Course Name	Course Code
ARTIFICIAL NETWORKS	821618009

Semester	Number of Course Hours per Week		Credit	ECTS
	Theory	Practice		
8	3	0		5

Course Category (Credit)				
Basic Sciences	Engineering Sciences	Design	General Education	Social
	X			

Course Language	Course Level	Course Type
Turkish	Undergraduate	Elective

<b>Prerequisite(s) if any</b>	Calculus I and Linear algebra,c omputer programming
<b>Objectives of the Course</b>	The course will teach a variety of neural networks and introduce the theory of some neural networks.
<b>Short Course Content</b>	Gives an introduction to basic (artificial) neural network architectures and learning rules. Emphasis is placed on mathematical analysis of these networks, on methods of training them, and on their application to practical problems

Learning Outcomes of the Course		Contributed PO(s)	Teaching Methods *	Measuring Methods **
1	Students will understand the concept of artificial neural networks.	1, 2, 5	1, 2, 6	A
2	Students will be able to learn artificial neural network techniques.	1, 2, 3	1, 2, 6	A
3	Students will be able to evaluate solutions found using these methods.	1, 2, 4	1, 2, 6	A
4	Students will be able to follow current research on artificial neural networks.	1, 2, 6	1.7. 11	A
5	Students will learn to use artificial neural network software packages.	1, 2, 5	1, 2, 6, 14	A

\*Teaching Methods 1:Expression, 2:Discussion, 3:Experiment, 4:Simulation, 5:Question-Answer, 6:Tutorial, 7:Observation, 8:Case Study, 9:Technical Visit, 10:Trouble/Problem Solving, 11:Individual Work, 12:Team/Group Work, 13:Brain Storm, 14:Project Design / Management, 15:Report Preparation and/or Presentation

\*\*Measuring Methods A:Exam, B:Quiz, C:Oral Exam, D:Homework, E:Report, F:Article Examination, G:Presentation, I:Experimental Skill, J:Project Observation, K:Class Attendance; L:Jury Exam

<b>Main Textbook</b>	Fundamentals of Neural Networks, Laurene V. Fausett
<b>Supporting References</b>	1) Neural Networks: A Comprehensive Foundation Simon S. Haykin
<b>Necessary Course Material</b>	

<b>Course Schedule</b>	
<b>1</b>	Introduction to artificial neural networks
<b>2</b>	Basics of network training
<b>3</b>	Supervised Learning: The Perceptron, Adalines
<b>4</b>	Supervised Learning: Multi-layer perceptrons (MLPs) Backpropagation
<b>5</b>	Unsupervised Learning: Simple Competitive Networks: Winner-take-all, Hamming network
<b>7</b>	Learning Vector Quantization (LVQ), Counterpropagation Networks (CPN)
<b>8</b>	Midterm
<b>9</b>	Adaptive Resonance Theory (ART)
<b>10</b>	Kohonen Self-Organizing Maps (SOMs)
<b>11</b>	Support Vector Machines
<b>12</b>	Applications
<b>13</b>	Hopfield Networks
<b>14</b>	Some applications of artificial neural networks
<b>15</b>	Some applications of artificial neural networks
<b>16,17</b>	Final Exam

<b>Calculation of Course Workload</b>			
<b>Activities</b>	<b>Number</b>	<b>Time (Hour)</b>	<b>Total Workload (Hour)</b>
Course Time (number of course hours per week)	14	3	42
Classroom Studying Time (review, reinforcing, prestudy,...)	14	3	42
Homework	5	3	15
Quiz Exam			
Studying for Quiz Exam			
Oral exam			
Studying for Oral Exam			
Report (Preparation and presentation time included)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	20	20
Final Exam	1	2	2
Studying for Final Exam	1	30	30
<b>Total workload</b>			<b>138</b>
<b>Total workload / 30</b>			<b>4,6</b>
<b>Course ECTS Credit</b>			<b>5</b>

Evaluation	
<b>Activity Type</b>	<b>%</b>
Mid-term	50
Quiz	
Homework	
Bir öge seçin.	
Bir öge seçin.	
<b>Final Exam</b>	50
<b>Total</b>	100

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	PROGRAM OUTCOME	Contribution
1	Adequate knowledge of mathematics, science and Computer Engineering; ability to practice theoretical and practical knowledge of these areas into modeling and solving problems of Computer Engineering.	3
2	Ability to identify complex engineering problems in Computer Engineering and related fields, for this purpose having skills to formulate, select and apply appropriate methods.	4
3	Having skills to apply modern design methods to design a complex system, equipment or product that should work under realistic conditions and constraints and satisfy specific requirements concerning the Computer Engineering.	2
4	Having skills to develop, select and apply modern techniques and tools needed for Engineering applications, skills to use information technology effectively.	3
5	Skills to design and conduct tests, collect data, analyze results, and interpret data for the experimental investigation of Computer Engineering problems.	3
6	Ability to function effectively as an individual and as a member of teams within the discipline and in multidiscipline areas.	3
7	Communicating effectively in oral and written form in Turkish and one foreign language.	3
8	Awareness of the necessity of lifelong learning, access to information, monitoring developments in science and technology and the ability to self-renewing.	3
9	Understanding of professional and ethical responsibility.	3
10	Information on project management, change management and risk management practices, awareness on entrepreneurship, innovation and sustainable development.	3
11	Information about universal and societal effects of engineering applications on health, safety and environment; awareness of the legal consequences of engineering solutions.	3

LECTUTER(S)				
<b>Prepared by</b>	Doç. Dr. Özer Çelik			
<b>Signature(s)</b>				

**Date:**06.06.2024