NEURAL NETWORKS AND APPLICATIONS

1	Course Title:	NEURAL NETWORKS AND APPLICATIONS
2	Course Code:	BMB3020
3	Type of Course:	Optional
4	Level of Course:	First Cycle
5	Year of Study:	3
6	Semester:	6
7	ECTS Credits Allocated:	5.00
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Doç. Dr. Metin BİLGİN
15	Course Lecturers:	
16	Contact information of the Course Coordinator:	Bilgisayar Müh. Bölüm Binası, 1. kat, oda 3 Tel.:+90 (224) 275 52 63 email: metinbilgin at uludag.edu.tr
17	Website:	
18	Objective of the Course:	The goal of the course is to give the students basic knowledge about techniques based on ANN (Artificial Neural Networks) and other learning methods and practical experience of using such methods with an understanding of the role of neural networks in computer engineering, computer science and artificial intelligence.
19	Contribution of the Course to Professional Development:	Engineering Science: 70%; Engineering Design: 30%
20	Learning Outcomes:	
	1	To learn basic concepts of artificial neural networks, mathematical and software background; to have ability to apply ANN to problems. To recognize the role of neural networks in computer engineering, computer science and artificial intelligence.
	2	To introduce and to learn ability to use popular ANN Tools like in Matlab. To enable to write simple ANN libraries in modern programming platforms (like Java and C#). To Develop Prediction, Estimation, Classification and Recognition Projects.
	3	To develop Intelligent Software; To recognize that how the computers learn; To design efficient ANN.
	4	To do research in state-of-the-art subjects of artificial neural area; preparing and doing presentation. To gain experience in reading and writing papers in ANN.
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21	Course Content:	

	Course Content:	
Week	Theoretical	Practice
1	Why use neural networks ? Biological fondations of ANNs.	
2	Application areas, typical architectures, activation functions	
3	McCulloch-Pitts Neuron	
4	Simple Neural Networks for Pattern Classification	
5	Perceptron, Adaline, Delta Rule	
6	Multilayer Perceptrons	
7	Radial Based Networks	
8	Gradient Descent, Backpropogation algorithms and variations	
9	Gradient Descent, Backpropogation algorithms and variations	
10	Learning Vector Quantization	
11	Pattern Association, learning algorithms, associative networks	
12	Hopfield Networks	
13	Recurrent Networks	
14	Application Examples	

Uygulamaları", Seçkin Yayıncılık, 425 s.

Comprehensive Foundation (2nd Edition)", Prentice-Hall, 842p.

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	5.00	70.00
Homeworks	1	30.00	30.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	2.00	2.00
Others	0	0.00	0.00
Final Exams	1	2.00	2.00
Total Work Load			148.00
Total work load/ 30 hr			4.87
ECTS Credit of the Course			5.00

23	Assessment		
TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**	
Midterm Exam	1	25.00	
Home work-project	1	25.00	
Total	3	100.00	
Contribution of Term (Year) Learning Activities to Success Grade			
Contribution of Final Exam to Success Grade	50.00		
Total	100.00		
Measurement and Evaluation Techniques Used in the Course	Midterm and Final Exams		

24	**ECTS / WORK LOAD TABLE**

25	**CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS**															
	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	3	4	4	4	4	3	2	2	2	2	2	2	0	0	0	0

ÖK2	3	4	4	4	4	3	2	2	2	2	2	2	0	0	0	0
ÖK3	3	4	4	4	4	3	2	2	2	2	2	2	0	0	0	0
ÖK4	3	4	4	4	4	3	2	2	2	2	2	2	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**