DEEP LEARNING BY PYTHON

1	Course Title:	DEEP LEARNING BY PYTHON
2	Course Code:	IYS4220
3	Type of Course:	Optional
4	Level of Course:	First Cycle
5	Year of Study:	4
6	Semester:	8
7	ECTS Credits Allocated:	6.00
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	There aren' ant prerequerements
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. MELİH ENGİN
15	Course Lecturers:	Doç. Dr. Melih Engin
16	Contact information of the Course Coordinator:	melihengin@uludag.edu.tr
17	Website:	
18	Objective of the Course:	Presenting the methods that can be used to learn high-level features obtained from different types of data by using deep architectures and showing how these methods can be applied for different purposes, from image recognition to robot control.
19	Contribution of the Course to Professional Development:	History and theoretical advantages of deep learning, Basic artificial neural network architectures and learning algorithms that can be used for deep learning, Organization of Distributed Models, Optimization Techniques for Training Deep Models, Convolutional networks, Feedback and recursive networks, Autoencoders and Linear Factor Models, Learning by Representation , Deep Generative Models – Boltzman Machines.
20	Learning Outcomes:	

	1	Students can evaluate common deep learning methods for their effectiveness.
	2	Students can evaluate the advantages and disadvantages of the deep learning method that is considered to be used.
	3	Students can design and test basic deep learning solutions.
	4	Students determine and implement the appropriate deep learning architecture and algorithm for the envisioned solution.
	5	Students have knowledge about deep model editing and optimization methods.
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21	Course Content:	
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Week	Theoretical	Practice
1	Introduction – History and Theoretical Foundations	
2	Mathematical Foundations: Linear Algebra, Probability and Information Theory	
3	Artificial Neural Networks Basic Information	
4	Feed Forward Deep Networks	
5	Organizing Deep or Distributed Models	
6	Optimization Techniques for Training Deep Models	
7	Convolutional Networks	
8	Convolutional Networks	
9	Autoencoders and Linear Factor Models	
10	Learning through Representation	
11	Deep Generative Models – Boltzman Machines	
12	Deep Generative Models – Boltzman Machines	
13	Project Presentations	
14	Project Presentations	
22	Textbooks, References and/or Other Materials:	Hinton, G. E, Osindero, S., and Teh, Y. W. (2006). A fast learning algorithm for deep belief nets. Neural Computation, 18:1527-1554. Bengio, Y., Lamblin, P., Popovici, P., Larochelle, H. (2007). Greedy Layer-Wise Training of Deep Networks, Advances in Neural Information Processing Systems.
23	Assesment	

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00
Contribution of Term (Year) Learning Activities to Success Grade	40.00	
Contribution of Final Exam to Success Grade	60.00	
Total	100.00	
Measurement and Evaluation Techniques Used in the Course	Classic Quiz	

| 24 | **ECTS / WORK LOAD TABLE** |

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	10	13.00	130.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	4.00	4.00
Others	0	0.00	0.00
Final Exams	1	4.00	4.00
Total Work Load			180.00
Total work load/ 30 hr			6.00
ECTS Credit of the Course			6.00

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	1	3	4	5	3	4	1	2	5	3	5	0	0	0	0	0
ÖK2	2	4	5	5	3	4	2	2	5	3	5	0	0	0	0	0
ÖK3	2	4	5	5	3	4	2	2	5	3	5	0	0	0	0	0
ÖK4	3	4	4	5	3	4	0	4	5	3	5	0	0	0	0	0
ÖK5	5	5	5	5	3	4	5	5	3	5	3	0	0	0	0	0

LO: Learning Objectives   PQ: Program Qualifications

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