Course Description Form	
Course Code and Name	CENG476 INTRODUCTION TO MACHINE LEARNING (TECH.ELECT.)
Course Semester	8
Catalog Content	To define and solve engineering problems using machine learning, the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and
Textbook	Deep Learning (Adaptive Computation and Machine Learning) by Ian Goodfellow (Author), Yoshua Bengio (Author), Aaron Courville (Author), Francis Bach (Editor), The MIT Press, 2016.
Supplementary Textbooks	Machine Learning, Tom M. Mitchell, McGraw-Hill Education Machine Learning: A Journey from Beginner to Advanced Including Deep Learning, Scikit-learn and Tensorflow Paperback – July 20, 2018 by Michael B. White (Author), CreateSpace Independent Publishing Platform, 2018
Credit	6
Prerequisites of the Course (*Attendance Requirements*)	There is no prerequisite or co-requisite for this course
Type of the Course	Elective
Instruction Language	English
Course Objectives	1. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health, and safety, manufacturability, and sustainability 2. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
Course Learning Outcomes	1. To be able to choose the most appropriate machine learning method for a given problem and data set 2. To develop a computer program for solving a problem 3. To be able to evaluate results
Instruction Methods	The mode of delivery of this course is Face to face
Weekly Schedule	1. Introduction to machine learning 2. The concept of learning 3. Decision Tree 4. Genetic algorithm 5. Genetic algorithm and programming 6. Genetic algorithm project 7. Bayesian learning 8. Artificial neural networks 9. Artificial neural networks 10. Artificial neural networks project 11. Support vector machine 12. Evaluation of learning algorithms, comparison 13. Unsupervised learning 14. Project presentation

Teaching and Learning Methods *(These are examples. Please fill which activities you use in the course)*	Weekly theoretical course hours: 3 Reading Activities Internet browsing, library work Designing and implementing materials Preparation of Midterm and Midterm Exam Final Exam and Preparation for Final Exam

Assessment Criteria

	Numbers	Total Weighting (%)	
Midterm Exams	1	30	
Assignment	0	0	
Application	0	0	
Projects	3	30	
Practice	0	0	
Quiz	0	0	
Percent of In-term Studies (%)		60	
Percentage of Final Exam to Total Score (%)		40	
Attendance	-	-	

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	3	42
Weekly Tutorial Hours	0	0	0
Reading Tasks	8	4	32
Studies	9	4	36
Material Design and Implementation	12	1	12
Report Preparing	0	0	0
Preparing a Presentation	0	0	0
Presentations	0	0	0
Midterm Exam and Preparation for Midterm Exam	1	13	13
Final Exam and Preparation for Final Exam	1	15	15
Other (should be emphasized)	0	0	0
Total Workload			150
Total Workload / 25			6
Course Credit (ECTS)			6

Contribution Level Between Course Learning

No	Program Outcomes	1	2	3	4	5
1	Sufficient knowledge on mathematics, science and computer engineering; ability to apply theoretical and practical knowledge in these areas to model and solve engineering problems				X	

Outcomes and Program Outcomes

#	Outcome	1	2	3	4	5
2	Ability to identify, define, formulate and solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for these purposes			X		
3	Ability to design a complex system, process, device, software, algorithm, or product under realistic constraints and circumstances to meet certain requirements; ability to apply modern design techniques for this purpose					X
4	Ability to choose, develop and use modern techniques and tools necessary for engineering applications; ability to effectively use computing technologies					X
5	Ability to design and implement systems or experiments to solve engineering problems, collect and interpret data to evaluate and analyze the results of solutions			X		
6	Ability to work effectively in intradisciplinary and interdisciplinary teams or individually					
7	Ability to efficiently prepare, evaluate and interpret reports		X			
8	Ability to make presentations and conduct effective verbal and written communication in Turkish and English		X			
9	Awareness of the necessity of lifelong learning; ability to access information, follow scientific and technological developments; ability to perpetually renew oneself		X			
10	Awareness of professional and ethical responsibility, ability to act in accordance with ethical principles		X			
11	Ability to apply knowledge on project management, risk management and change management	X				
12	Awareness of entrepreneurship and innovation, ability to design and build sustainable systems		X			
13	Ability to devise local and global solutions to contemporary issues considering the effects of engineering applications on health, environment and security			X		
14	Awareness of the legal consequences of engineering solutions	X				
15	Ability to apply knowledge on software development process and documentation rules	X		X		
16	Knowledge on standards used in engineering applications		X			

	17	Awareness of occupational health and security, information security and privacy	X			
The Course's Lecturer(s) and Contact Information		Lec. Dr. Oktay YILDIZ oyildiz@gazi.edu.tr				