ECTS COURSE INFORMATION FORM

Faculty	**Faculty of Engineering**	
Program	**B.Sc. in Civil Engineering**	**Elective**
	B.Sc. in Computer Engineering	**Elective**
	B.Sc. in Electrical-Electronics Engineering	**Elective**
	B.Sc. in Industrial Engineering	**Elective**
	B.Sc. in Mechanical Engineering	**Elective**

Course Code	COMP 462			
Course Title in English	Introduction to Machine Learning			
Course Title in Turkish	Yapay Öğrenmeye Giriş			
Language of Instruction	English			
Type of Course	Flipped Classroom			
Level of Course	Undergraduate			
Course Category (by % of Content)	Basic Science	Basic Engineering	Engineering Design	General Education
	10	30	60	0
Semester Offered	Fall			
Contact Hours per Week	Lecture: 3 hours	Recitation: -	Lab:-	Other:-
Estimated Student Workload	152 hours			
Number of Credits	6 ECTS			
Grading Mode	Standard Letter Grade			
Pre-requisites	None			
Expected Prior Knowledge	Prior knowledge in programming, probability and statistics.			
Co-requisites	None			
Registration Restrictions	Only Undergraduate Students			
Overall Educational Objective	To learn fundamentals of machine learning methods and how to design and implement intelligent systems to make prediction, classification, and regression.			
Course Description	This course covers the fundamentals of machine learning approaches: Supervised learning, unsupervised learning, regression methods, outlier detection, feature analysis, validation and evaluation.			
Course Description in Turkish	Bu ders yapay öğrenmede kullanılan temel yöntemleri içermektedir: Gözetimli ve gözetimsiz öğrenme, bağlanım yöntemleri, aykırılık tespiti, öznitelik analizi, geçerleme ve performans değerlendirmesi			
Course Learning Outcomes and Competences	Upon successful completion of the course, the learner is expected to: 1. identify and solve a complex engineering problem using machine learning techniques; 2. design a machine learning system to produce solutions; 3. present the results of a machine learning solution to a range of audiences; 4. recognize ethical and professional responsibilities in creating the machine learning system; 5. analyze and interpret the data used for the machine learning system; 6. acquire and apply new knowledge of machine learning techniques.			

Relationship of the Course with the Student Outcomes	Level	Learning Outcome(s)	Assessed by
Student Outcomes	N=None S=Supportive H=High		Exam, Project, HW, Experiment, Presentation, etc.
(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	H	1	Exams, Assignments, Project
(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	H	2	Exams, Assignments, Project
(3) an ability to communicate effectively with a range of audiences	S	3	Assignments, Project
(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	S	4	Assignments, Project
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives			
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	S	5	Assignments, Project
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	S	6	Assignments, Project

Prepared by and Date	Berk Gökberk / March 2020	
Semester	Spring 2019-2020	
Name of Instructor	Berk Gökberk	
Course Contents	Week	Topic
	1.	Introduction to Machine Learning Concepts
	2.	K Nearest Neighbor Algorithm
	3.	Training, Testing and Validating Machine Learning Systems
	4.	Clustering Techniques
	5.	Decision Trees (Part 1)
	6.	Decision Trees (Part 2)
	7.	Gradient Descent Algorithm and Linear Regression
	8.	Logistic Regression
	9.	Feature Selection and Extraction Techniques
	10.	Advanced Classification Methods
	11.	Artificial Neural Networks (Part 1)
	12.	Artificial Neural Networks (Part 2)
	13.	Deep Learning Methods (Part 1)
	14.	Deep Learning Methods (Part 2)
	15.	Final Exam/Project/Presentation Period
	16.	Final Exam/Project/Presentation Period
Required/Recommended Readings	Recommended Book: Introduction to Machine Learning, Ethem Alpaydın, MIT Press	
Teaching Methods	Flipped Classroom	
Homework and Projects	Assignments	
Laboratory Work	-	

Computer Use	Required
Other Activities	-
Assessment Methods	Midterm Exam (35%), Term Project (30%), Assignments (35%)
Course Administration	Instructor's office: Room 540 (5th floor) Phone number: 0 212 395 37 45 Office hours: After the lecture hours. E-mail address: gokberkb@mef.edu.tr Rules for attendance: No attendance required. Statement on plagiarism: YÖK Regulations http://3fcampus.mef.edu.tr/uploads/cms/webadmin.mef.edu.tr/4833_2.pdf

ECTS Student Workload Estimation

Activity	No/Weeks	Hours			Calculation	Explanation
	No/Weeks per Semester (A)	Preparing for the Activity (B)	Spent in the Activity Itself (C)	Completing the Activity Requirements (D)		
Lecture/Flipped Classroom	14	1	3	1	70	A*(B+C+D)
Quizzes					0	
Midterm(s)	1	10	2	2	14	A*(B+C+D)
Assingment, Project, Presentation	4	1	14	2	68	A*(B+C+D)
Final Examination						A*(B+C+D)
Total Workload					152	
Total Workload/25					6,08	
ECTS					**6**	