

<b>Faculty</b>	<b>Faculty of Engineering</b>		
<b>Program</b>	<b>B.Sc. in Civil Engineering</b>	<b>Elective</b>	
	<b>B.Sc. in Computer Engineering</b>	<b>Elective</b>	
	<b>B.Sc. in Electrical-Electronics Engineering</b>	<b>Elective</b>	
	<b>B.Sc. in Industrial Engineering</b>	<b>Elective</b>	
	<b>B.Sc. in Mechanical Engineering</b>	<b>Elective</b>	

<b>Course Code</b>	COMP 450			
<b>Course Title in English</b>	Artificial Intelligence			
<b>Course Title in Turkish</b>	Yapay Zeka			
<b>Language of Instruction</b>	English			
<b>Type of Course</b>	Flipped Classroom/Lecture/Exercise			
<b>Level of Course</b>	Undergraduate			
<b>Course Category (by % of Content)</b>	Basic Science	Basic Engineering	Engineering Design	General Education
	10	30	50	10
<b>Semester Offered</b>	Fall			
<b>Contact Hours per Week</b>	Lecture: 2 hours	Recitation: -	Lab: 2 hours	Other:-
<b>Estimated Student Workload</b>	156 hours			
<b>Number of Credits</b>	6 ECTS			
<b>Grading Mode</b>	Standard Letter Grade			
<b>Pre-requisites</b>	-			
<b>Expected Prior Knowledge</b>	Basic mathematics knowledge			
<b>Co-requisites</b>	None			
<b>Registration Restrictions</b>	Only Undergraduate Students			
<b>Overall Educational Objective</b>	To learn the fundamental concepts of Artificial Intelligence and to become familiar with basic aspects of intelligent agents, knowledge representation, learning, and sensing.			
<b>Course Description</b>	This course provides a comprehensive introduction to some fundamental aspects of Artificial Intelligence. The following topics are covered: Introduction, Intelligent agents, Search algorithms, A*search and heuristics, constraint satisfaction problems, Game trees, Knowledge representation, Learning: reinforcement learning, Decision trees, evolutionary methods, Artificial Neural Networks, Perceptions, Deep Learning, Perception: Vision.			
<b>Course Description in Turkish</b>	Bu derste; yapay zekanın temel kavramları şu konu başlıklar altında kapsamlı bir şekilde incelenmektedir: Akıllı etmenler, arama yöntemleri, A* arama ve sezgisel arama yöntemleri, kısıt altında arama yöntemleri, oyun ağaçları, bilgi gösterimi, öğrenme, güdümlü öğrenme, karar ağaçları, evrimsel yöntemler, Yapay Sinir Ağları (YSA) , Perseptronlar ve Derin Öğrenme, Algılama:Yapay Görü.			
<b>Course Learning Outcomes and Competences</b>	Upon successful completion of the course, the learner is expected to:			
	<ol style="list-style-type: none"> <li>1. identify, formulate, and solve artificial intelligence problems by applying principles of engineering as well as science and mathematics;</li> <li>2. communicate effectively with a range of audiences via the lab reports and project presentations;</li> <li>3. recognize ethical and professional responsibilities in engineering situations that are directly related to artificial intelligence and related technologies while considering the impact of engineering solutions in global, economic, environmental, and societal contexts;</li> </ol>			

4. function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;
5. develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions for the given cases related to artificial intelligence;
6. acquire and apply contemporary issues and methods in artificial intelligence with using appropriate learning strategies.

Relationship of the Course with the Student Outcomes	Level	Learning Outcome(s)	Assessed by
<b>Student Outcomes</b>	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	Exam, Project, Lab Work
(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			
(3) an ability to communicate effectively with a range of audiences	S	2	Project, Lab Work
(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	H	3	Exam, Project, Lab Work
(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	S	4	Project
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	H	5	Exam, Project, Lab Work
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	H	6	Lab Work

<b>Prepared by and Date</b>	Assist. Prof. Dr. Tuna Çakar/ February 2020	
<b>Semester</b>	Fall 2019-2020	
<b>Name of Instructor</b>	Assist. Prof. Dr. Tuna Çakar	
<b>Course Contents</b>	Week	Topic
	1.	Introduction
	2.	Intelligent Agents & Game Playing
	3.	Searching
	4.	Informed Search Methods
	5.	Constraint Satisfaction
	6.	Probability
	7.	Bayes Nets
	8.	Machine Learning
	9.	Deep Learning
	10.	Pattern Recognition
	11.	Logic and Planning
	12.	Planning under Uncertainty
	13.	Project Presentations
	14.	General Review

	15.	Final Exam/Project/Presentation
	16.	Final Exam/Project/Presentation
<b>Required/Recommended Readings</b>	Artificial Intelligence: A Modern Approach (3rd Edition), Stuart Russell, Peter Norvig, Prentice Hall, 2010	
<b>Teaching Methods</b>	Flipped classroom. Students work individually for assignments.	
<b>Homework and Projects</b>	Assignments & Project	
<b>Laboratory Work</b>	Application-based laboratory study	
<b>Computer Use</b>	Required	
<b>Other Activities</b>	-	
<b>Assessment Methods</b>	Exam (25%), Lab Work (25%), Assignments (25%), Term-Project (25%)	
<b>Course Administration</b>	Instructor's office: 5th floor Phone number: 0 212 395 37 50 Office hours: After the lecture hours. E-mail address: cakart@mef.edu.tr Rules for attendance: No attendance required. Statement on plagiarism: YÖK Regulations	

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	2		42	A*(B+C+D)
	Book Chapter	1	1	10		11	
	Lab Work	10	1	2	0	30	A*(B+C+D)
	Assingments	10	1	2	0	30	A*(B+C+D)
	Final Examination	1	10	3	0	13	A*(B+C+D)
	Term-project	1	5	25	0	30	
	Total Workload					156	
	Total Workload/25					6.24	