



MARMARA UNIVERSITY - FACULTY OF ENGINEERING

2017-2018 Fall

CSE4082 – Artificial Intelligence

COURSE DESCRIPTION FORM

Offering Department	Department of Computer Engineering		Technical Elective					
Course Code	CSE4082							
Course Name	Artificial Intelligence							
Language of Instruction	English							
ECTS	5							
Contact Hours	Theoretical (T): 3	Practice (P): 0	Laboratory (L): 0					
Pre-requisites								
Instructor	Name	Assist. Prof. Dr. Ali Haydar Özer						
	E-mail	haydar.ozero@marmara.edu.tr						
Course Materials	Mandatory	Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, 3rd ed., Pearson.						
	Recommended							
Course Objectives	The main objective of this course is to attract the interest of students in the field of artificial intelligence (AI) by introducing AI based basic problem-solving techniques. Students will be able to analyze the problems they will come across, to apply AI based problem solving techniques to these problems, and to reach the required level for performing research studies in the field of AI.							
Course Content	Introduction to AI and introductory topics. Intelligent agents. Uninformed search techniques. Informed (heuristic) search techniques. NP-Completeness and hard problems. Heuristic methods: local search, simulated annealing, k-neighborhood search, genetic algorithm. Game playing: minimax, expecti-minimax and alpha-beta pruning algorithms. Introduction to Prolog programming language.							
Learning Outcomes	LO1	To understand the concept of artificial intelligence and rationality, to define the basic issues and objectives of artificial intelligence.						
	LO2	To be able to define search problems formally, to apply uninformed and heuristic search techniques to search problems.						
	LO3	To develop heuristic algorithms for NP-Hard problems.						
	LO4	To design artificial intelligence players for deterministic and chance-based games.						
	LO5	To have intermediate level knowledge in Prolog programming language.						
Program Outcomes		LO1	LO2	LO3	LO4	LO5		
PO1	Adequate knowledge in mathematics, science (a) and computer engineering subjects (b) pertaining to the relevant discipline (1); ability to use theoretical and applied information in these areas to model and solve engineering problems (2).		1b	1b, 2	1b, 2	1b	1b	
PO2	Ability to identify, formulate, and solve complex engineering problems (a); ability to select and apply proper analysis and modelling methods for this purpose (b).			a	a			
PO6	Ability to work efficiently in intra-disciplinary (a) and multi-disciplinary teams (b); ability to work individually (c).			a	a			
Subjects (Knowledge, Skills and behaviors), Contributions of Subjects to Learning Outcomes, Assessment Methods	No	Week	Subjects	LO1	LO2	LO3	LO4	LO5
	S1	1-2	Introduction to AI, Agents, Defining Problems.	MF				
	S2	3-4	Uninformed Search Techniques: DFS, BFS, Depth-Limited Search, Iterative Deepening Search.		MF, P			
	S3	4-5	Informed Search Techniques: Greedy Best First Search, Admissible Heuristics - A* Search.		MF, P			
	S4	6-7	Heuristic Techniques for NP-Hard problems: Local Search, Simulated Annealing, Threshold Accepting, Genetic Algorithms.			MF, P		
	S5	8	Game Playing – Deterministic Games				MF	
	S6	9	Game Playing – Chance-Based Games				MF	
	S7	10-11	PROLOG Programming – Syntax, Meaning of Prolog programs.					MF
S8	12	PROLOG Programming – Lists,					MF	

			Operators and Arithmetic.						
	S9	13	PROLOG Programming - Structures						MF
	S10	14	PROLOG Programming - Backtracking						MF
Assessment Methods and Weights	No	Type		Weight	Implementation Rule		Make-up Rule		
	MF	Midterm, Final		70%	One closed-book midterm exam and one closed-book final exam are given.		Marmara University regulations will be followed for make-up exams.		
	P	Project		30%	Two programming projects are given. Students are required to work in groups of two.				
	TOTAL			100%					
Determining Letter Grades	<ul style="list-style-type: none"> The letter grades will be determined based on the midterm and final exams and 2 projects. In order to determine the letter grade, a curve or catalog-based method will be followed based on the total average scores of the students. The final exam score and the total average score of the student must be at least 35 to pass the course. According to Marmara University Undergraduate regulations, the weight of the final exam must be at least 40 out of 100. 								
	Assessment		Midterm		Project		Final		TOTAL
	Weight		30		30		40		100
Teaching Method, Student Work Load	Time Applied by the Instructor								
	No	Method		Explanation				Hours	
	1	Lectures		Lectures are given in class using the board or via presentations. Example questions are solved to enhance the concepts.				14x3=42	
	2	Problem Session/ Practice		Problems related to the course topics are solved on the board.					
	3	Laboratory		Experiments are done in the laboratory or theoretical concepts covered during the lectures are practiced using computer exercises.					
	4	Interactive Courses		Questions are asked to students during lectures and they are encouraged to guess the answers (peer learning is also in this category)					
	5	Field Work		Students attend activities outside the campus.					
	6	Midterm		Midterm exam is given during the midterm week.				2	
	7	Final		Final exam is given during the final exam week.				2	
	Estimated Time to be Allocated by a Student								
	8	Projects		The students carry out research about the problem given in the project, design and implement their solution and prepare a report.				2x17=34	
	9	Homework		The students solve the problems given as homework.					
	10	Pre-class learning of Course Material		The students study and learn the new subjects from course materials.				0.5x42=21	
11	Review of Course Material		Students review the course subjects from course materials to prepare for the exams and homework.				0.5x42=21		
12	Office Hour		Students ask questions to the instructor or the assistant during office hours.				3		
Total								125	
Academic Honesty	Violations of scholastic honesty include, but are not limited to cheating, plagiarizing, fabricating information or citations, facilitating acts of dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students.								
	In case academic dishonesty is observed, the first authority is the instructor of the course. The instructor may decide to give the student zero for the homework(s)/lab(s)/exam(s), give the letter grade FF, or may take disciplinary action.								