Сс	ourse Description Form					
Course Code and Name	CENG455 INTRODUCTION ARTIFICIAL INTELLIGENCE (TECH.ELECT.)					
Course Semester	7					
Catalog Content	To cover basic AI techniques including search strategies, representation schemes, problem solving paradigms, logic programming, planning problems, machine learning algorithms, probability and uncertainty etc					
Textbook	Artificial Intelligence: Foundations of Computational Agents 2nd Edition by David L. Poole (Author), Alan K. Mackworth (Author), Cambridge University Press, 2017					
Supplementary Textbooks	Artificial Intelligence: A Modern Approach (2nd Edition) by Stuart J. Russell and Peter Norvig					
	Applied Artificial Intelligence: A Handbook For Business Leaders Paperback – June 5, 2018 by Mariya Yao (Author), Adelyn Zhou (Author), Marlene Jia (Author), Topbots Inc., 2018					
Credit	6					
Prerequisites of the Course (<i>Attendance Requirements</i>)	There is no prerequisite or co-requisite for this course					
Type of the Course	Elective					
Instruction Language	English					
Course Objectives	To have a basic proficiency in programming of AI and machine learning systems including an ability to write simple to intermediate programs and an ability to understand code written in that language.					
Course Learning Outcomes	 Use and apply current technical concepts and practices in core computing and information technologies in AI related topics Analyze a problem, and identify and define the computing and algorithmic requirements appropriate to its solution. 					
Instruction Methods	The mode of delivery of this course is Face to face.					
Weekly Schedule	 Definitions of intelligence and artificial intelligence State-space approach, problem-reduction approach Problem model, problem presentation Detailed search algorithms (breadth-first, depth-first, iterative deepening) Heuristic search algorithms Game theory Syntax and semantics Deductive inference, predicate logic, production systems Semantics networks and frameworks Rule based expert systems, inference engine Machine learning: induction, command learning, learning with examples Classification, explanation based learning, relational and intuitive learning Artificial intelligence applications 					
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 Preparation of Midterm and Midterm Exam Final Exam and Preparation for Final Exam					

Midterm Exums 0 0 Assessment Criteria 1 30 30 Application 0 0 0 Practice 0 0 0 Quiz 0 0 0 Practice 0 0 0 Quiz 0 0 0 Precent of In-term 0 60 0 Studies (%) 1 1 1 1 Percent of States (%) 1 1 1 1 Attivity Number Weekly Northow Work Workload 10 4 3 - 1 Workload 10 4 0 - - Workload 10 4 0 - - Reading Tasks 10 4 0 - - Noticital Design and 0 0 0 - - Proparition 0 0 0 <			Numbe	rs Total Weighti	ng		
Assessment Criteria I 30 Application 0 0 0 Projects 0 0 0 Quiz 0 0 0 0 Projects 0 0 0 0 Daties (%) 0 0 0 0 0 Percent of In-term 0 40 0 0 0 Name 0 1 1 0		Midterm Exams	1	30			
Assessment Criteria Application 0 0 0 Proteice 0		Assignment	1	30			
Projects 0 0 0 Procent of In-term 0 60 0 Buckies (%) 0 0 0 0 Percentage of Final Exam to total Score (%) 0 0 0 0 Reading Control Level (%) 0 0 0 0 0 Attivity Number of Weeks Duration (weekly mour) Duration (weekly mour) Vork Load Weekly Theoretical Course Hours 14 3 42 - - Weekly Theoretical Course Hours 10 4 40 - - Reading Tasks 10 4 40 - - - Reading Tasks 10 4 40 - - - - Report Preparing 0 0 0 - - - - Report Preparing a 0 60 0 - - - - Presentations 0 40 0 - - - </th <th>Assessment Criteria</th> <td>Application</td> <td>0</td> <td>0</td> <td></td> <td></td>	Assessment Criteria	Application	0	0			
Practice 0 0 Quiz 0 0 Percent of In-term 0 60 Statistics (%) 0 40 Exam to Total Score (%) 1 1 Activity Total Nomber Period Period Weekly Theoretical 14 3 42 Load Course Hours 1 4 3 42 Load Weekly Theoretical 14 3 42 Load Load Course Hours 10 4 40 Load L		Projects	0	0			
Variable	-	Practice	0	0			
Studies (%) Image of Final Decentage of Final Decent Decentage of Final Decentage of Final Decentage of Fi		Percent of In-term	0 60				
Percentage of Pinal Exam to Total Score (%) 0 40 Attendance - - - Attendance - - - Weekly Theoretical Course Hours 14 3 42 - Weekly Theoretical Course Hours 10 4 40 - - Weekly Tutorial Hours 0 0 0 - - - Weekly Tutorial Hours 0 4 40 -		Studies (%)					
Item to 1 out score (%) Image: Non-Instant instant ins		Percentage of Final	0	40			
Activity Total Number of Weeks Duration (weekly hour) Total Period Work Load Weekly Theoretical Course Hours 14 3 42		Attendance	_	-			
Activity Number of Weekly Nour Weekly Nour Period Work Load Weekly Theoretical Course Hours 14 3 42			Total	Duration	Total	Total	
WorkloadWeekly Theoretical Course Hours14342Weekly Tutorial Hours000Reading Tasks10440Studies1040Material Design and Implementation00Report Preparing Preparing a000Preparing a0600Presentation11312Preparation for Midtern Exam and Midtern Exam11312Final Exam and Other00Other Course Credit (ECTS)00Total Workload / 25006Contribution Level Between Course Learning Outcomes and Program Outcomes123452Ability to identify, define, formulate and solve engineering problems123452Ability to identify, define, formulate and solve complex engineering problems1111112Ability to identify, define, formulate and solve complex engineering problems1111114AA112345151Sufficient knowledge on mathematics, science and computer engineering problems1111111 <t< th=""><th></th><th>Activity</th><th>Number of Weeks</th><th>(weekly hour)</th><th>Period Work Load</th><th></th></t<>		Activity	Number of Weeks	(weekly hour)	Period Work Load		
WorkloadWeekly Tutorial Hours000Reading Tasks104405Studies104405Studies104405Material Design and0005Report Preparing0005Preparing a06005Presentation113125Presentation for13125Preparation for11515Final Exam and11515Other00150Other006Other006Course Credit (ECTS)006Course Credit (ECTS)006Course Credit (ECTS)00150Sufficient knowledge on mathematics, science and computer engineering; ability to apply theoretical and practical knowledge in these areas to model and solve complex engineering roblems; ability to identify, define, formulate and solve complex engineering roblems; ability to choose and apply appropriat analysis and modelling methods for these11		Weekly Theoretical Course Hours	14	3	42		
WorkloadIO440Studies10440Material Design and Implementation00Report Preparing Preparing a060Presentation00Presentation00Presentation113Presentation for Midterm Exam113Final Exam and Preparation for Final Exam115Final Exam and Preparation for Final Exam115Total Workload00Other Course Credit (ECTS)00Total Workload0012341Sufficient knowledge on mathematics, science and computer engineering; ability to apply theoretical and practical knowledge in these areas to model and solve engineering problems123452Ability to identify, define, formulate and solve engineering problems; ability to choose and apply appropriate analysis and modelling methods for thesexxx		Weekly Tutorial Hours	0	0	0		
Studies10440Material Design and Implementation000Report Preparing0000Preparing a06000Presentation0400Presentations0400Presentations0400Presentations0400Preparation for Midtern Exam11312Final Exam Exam11515Other (should be emphasized)000Total Workload0006Contribution Level Between Course Learning Outcomes and Program Outcomes123451Sufficient knowledge on mathematics, science and computer engineering; ability to apply theoretical and practical knowledge in these areas to model and solve engineering problems; ability to choose and apply appropriate analysis and modelling methods for thesexxx		Reading Tasks	10	4	40		
Material Design and Implementation0000Report Preparing00000Preparing a060000Preparing a000000Presentation0400000Preparation for Midterm Exam11312121Final Exam and Preparation for Final Exam115151515Other (should be emphasized)0015011Total Workload0001511Total Workload / 25006111No Course Credit (ECTS)00111111Sufficient knowledge on mathematics, science and computer engineering; ability to apply theoretical and practical solve engineering problems123451Sufficient knowledge in these areas to model and solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for these111 <t< th=""><th></th><td>Studies</td><td>10</td><td>4</td><td>40</td><td></td></t<>		Studies	10	4	40		
Report Preparing 0 0 0 Preparing a 0 60 0	Workload	Material Design and Implementation	Material Design and00mplementation				
Preparing a Presentation0600 \cdot PresentationPresentation11312 \cdot Presentations0400 \cdot \cdot \cdot Midterm Exam and Preparation for Midterm Exam11312 \cdot \cdot Final Exam and 		Report Preparing	0	0	0		
$ \begin{array}{ c c c c c c } \hline Presentation & 0 & 40 & 0 & \hline \\ \hline Presentations & 0 & 40 & 0 & \hline \\ \hline Presentations & 0 & 40 & 0 & \hline \\ \hline \\ \hline Presentations for Midterm Exam and 1 & 13 & 12 & \hline \\ \hline \\ Preparation for Midterm Exam & 1 & 15 & 15 & \hline \\ \hline \\ \hline \\ Preparation for Final Exam and 1 & 15 & 15 & \hline \\ \hline \\ Preparation for Final Exam & 0 & 0 & 0 & \hline \\ \hline \\ \hline \\ Other & 0 & 0 & 0 & 0 & \hline \\ \hline \\ Other & 0 & 0 & 0 & 0 & \hline \\ \hline \\ \hline \\ Other & 0 & 0 & 0 & \hline \\ \hline \\ \hline \\ \hline \\ Total Workload & 0 & 0 & 150 & \hline \\ \hline \\ \hline \\ Total Workload / 25 & 0 & 0 & 6 & \hline \\ \hline$		Preparing a	0	60	0		
Presentations 0 40 0 Midterm Exam and Preparation for Midterm Exam 1 13 12 Final Exam and Preparation for Final Exam 1 15 15 Other 0 0 0 0 Other 0 0 0 150 Total Workload 0 0 6 1 Total Workload / 25 0 0 6 1 Contribution Level Between Course Learning Outcomes and 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 x 2 Ability to identify, define, formulate and solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for these x x		Presentation	0	40	0	_	
Midderm Exam and Preparation for Midterm Exam 1 15 12 Final Exam and Preparation for Final Exam 1 15 15 Final Exam and Preparation for Final Exam 1 15 15 Other (should be emphasized) 0 0 0 15 Total Workload 0 0 0 15 Total Workload / 25 0 0 6 Course Credit (ECTS) 0 0 6 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 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 1 x x		Presentations Midtarm Exam and	0	40	0		
Final Exam and Preparation for Final Exam 1 15 15 Other 0 0 0 (should be emphasized) 0 0 0 Total Workload 0 0 0 Total Workload / 25 0 0 6 Course Credit (ECTS) 0 0 6 Vorkload / 25 0 0 6 Course Credit (ECTS) 0 0 6 Vorkload / 25 0 0 6 Course Credit (ECTS) 0 0 6 Vorkload / 25 0 0 6 Course Credit (ECTS) 0 0 6 Vorkload / 25 0 0 6 Course Credit (ECTS) 0 0 6 Vorkload / 25 0 0 6 Course Credit (ECTS) 0 0 6 Vorkload / 25 0 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 complex engineering proble		Preparation for Midterm Exam	1	15	12		
$\frac{ 2Xam }{ C } = 0 \qquad 0 \qquad 0$		Final Exam and Preparation for Final	1	15	15		
(should be emphasized) i <th></th> <th colspan="3">Other 0 0</th> <th colspan="3">0</th>		Other 0 0			0		
Image: Contribution Level Between Course Learning Outcomes and Program Outcomes I <th< th=""><th></th><td>(should be emphasized)</td><td></td><td></td><td></td><td></td></th<>		(should be emphasized)					
Total Workload / 25 0 0 6 Course Credit (ECTS) 0 0 6 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 x x 2 Ability to identify, define, formulate and solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for these x x		Total Workload		0	150		
Course Credit (ECTS) 0 0 6 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 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 4		Total Workload / 25	0	0	6		
NoProgram Outcomes123451Sufficient knowledge on mathematics, science and computer engineering; ability to apply theoretical and practical knowledge in these areas to model and solve engineering problemsxxx2Ability to identify, define, formulate and solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for thesexx		Course Credit (ECTS)	0	0	6		
Contribution Level Between Course Learning Outcomes and Program Outcomes 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 x 2 Ability to identify, define, formulate and solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for these x x		No Program Outcome	S	1	2 3 4 5	5	
Contribution Level Between Course Learning science and computer engineering; ability Outcomes and Program Outcomes knowledge in these areas to model and 2 Ability to identify, define, formulate and solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for these ability to choose and apply appropriate		1 Sufficient knowled	dge on math	ematics,	х		
Contribution Level Between Course Learning Outcomes and Program Outcomes it to apply theoretical and practical knowledge in these areas to model and solve engineering problems 2 Ability to identify, define, formulate and solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for these		science and compu	iter enginee	ring; ability			
Contribution Level Between Course Learning Solve engineering problems Outcomes and Program Outcomes 2 Ability to identify, define, formulate and solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for these x	Contribution Level Between Course Learning	to apply theoretica	and practic	cal			
Outcomes and Program Outcomes 2 Ability to identify, define, formulate and solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for these x		solve engineering	problems				
solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for these	Outcomes and Program Outcomes	2 Ability to identify	, define, form	nulate and	x		
ability to choose and apply appropriate analysis and modelling methods for these		solve complex eng	gineering pro	oblems;			
analysis and modelling methods for these		ability to choose a	nd apply app	propriate			
		analysis and mode	ming method	us for these			

	3	Ability to design a complex system, process, device, software, algorithm, or				х
		product under realistic constraints and				
		circumstances to meet certain				
		requirements; ability to apply modern				
	4	Ability to choose, develop and use			Х	
		engineering applications: ability to				
		effectively use computing technologies				
	5	Ability to design and implement systems			x	
	5	or experiments to solve engineering				
		problems, collect and interpret data to				
		evaluate and analyze the results of				
		solutions				
	6	Ability to work effectively in			х	
		intradisciplinary and interdisciplinary				
		teams or individually				
	7	Ability to efficiently prepare, evaluate and			х	
	0	Interpret reports	-	+		v
	8	effective verbal and written				А
		communication in Turkish and English				
	9	Awareness of the necessity of lifelong			х	
		follow scientific and technological				
		developments: ability to perpetually				
		renew oneself				
	10	Awareness of professional and ethical			х	
		responsibility, ability to act in accordance				
		with ethical principles				
	11	Ability to apply knowledge on project			х	
		management, risk management and				
		change management				
	12	Awareness of entrepreneurship and		х		
		innovation, ability to design and build				
		sustainable systems				
	13	Ability to devise local and global		х		
		solutions to contemporary issues				
		considering the effects of engineering				
		applications on health, environment and				
	14	Awareness of the legal consequences of	x			
	1 T	engineering solutions	Ī			
	15	Ability to apply knowledge on software		х		
		development process and documentation				
		rules				
	16	Knowledge on standards used in	х	\uparrow		
		engineering applications				
	17	Awareness of occupational health and	Х			
		security, information security and privacy			1	
The Course's Lecturer(s) and Contact nformation	C br	omputer Engineering Department Chair nbb@gazi.edu.tr				