COURSE DESCRIPTION FORM	
Course Code and Name	CENG445 ALGORITHMIC GAME THEORY (TECH. ELECT.)
Course Semester	7
Catalogue Data of the Course (*Course Content*)	Basics of Algorithmic Game Theory, Prisoner's dilemma, Nash equilibrium, Mechanism Design, Auction theory, Evolutionary games
Course Textbooks	Nisan, Noam, Tim Roughgarden, Eva Tardos, and Vijay V. Vazirani. Algorithmic Game Theory. Cambridge, UK: Cambridge University Press, 2007.
Supplementary Textbooks	Osborne, Martin J. An Introduction to Game Theory. Oxford University Press, 2004. Poundstone, William. Games of Strategy. Pantheon Books, 2005.
Credit (*ECTS*)	6
Prerequisites for the Course (*Attendance Requirements*)	There is no prerequisite or co-requisite for this course.
Course Type	Elective
Language of Instruction	English
Course Objectives	Students will be able to understand and apply the principles of game theory to analyze strategic interactions in various fields.
Course Learning Outcomes	1. Define and explain key concepts in game theory 2. Identify and differentiate between different types of games 3. Explain the basic ideas of computational game theory 4. Analyze and compare different auction mechanisms
Instruction Method *(Face-to-face, Distance education etc.)*	The mode of delivery of this course is face to face.
Weekly Schedule of the Course	Week 1: Foundations of Game Theory Week 2: Prisoner's dilemma and coordination games Week 3: Nash equilibrium Week 4: Algorithmic Aspects of Games: Week 5: Equilibria in different games Week 6: No-regret learning Week 7: Mechanism Design Week 8: Auction theory Week 9: Resource allocation mechanisms Week10: Applications of Algorithmic Game Theory Week 11: Real-world case studies Week12: Future applications Week 13: Repeated games, Week 14: Evolutionary games
Teaching Activities *(The time spent for the activities listed here will determine the amount of credit required)*	Weekly theoretical course hours: 3 Reading activities Designing and implementing materials Midterm and revision for midterm Final exam and revision for final exam

Assessment Criteria

	Number(s)	**Weight (%)**
Midterm exam	1	20
Assignment		
Application		
Project	1	40
Practice		

	Quiz		
	Final exam	1	40
	Total	3	100

Workload of the Course

Activity	Number of Weeks	Duration (Weekly Hour)	End of Semester Total Workload
Weekly theoretical course hours	14	3	42
Weekly practical course hours			
Reading activities	12	4	48
Internet search and library work			
Designing and implementing materials	10	3	30
Making a report			
Preparing and making presentations			
Midterm and revision for midterm	1	15	15
Final exam and revision for final exam	1	15	15
Total workload			150
Total workload/ 25			6
Course Credit (ECTS)			6

Contribution Level between Course Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Knowledge of mathematics, science, basic engineering, computing, and computer engineering; ability to use this knowledge in solving complex engineering problems.					x
2	Ability to define, formulate and analyze complex engineering problems using basic science, mathematics and engineering knowledge and considering the UN Sustainable Development Goals relevant to the problems addressed.			x		
3	Ability to design creative solutions to complex engineering problems; ability to design complex systems, processes, devices, software, algorithms or products to meet current and future requirements, considering realistic constraints and conditions.				x	
4	Ability to select, use and develop appropriate techniques, resources and modern engineering and informatics tools, including estimation and modeling, for the analysis and solution of complex engineering problems while being aware of their limitations.				x	
5	Ability to use research methods to examine complex engineering problems or research topics in computer engineering, including reviewing the literature, designing experiments, conducting experiments, collecting data, analyzing and interpreting results.			x		
6	Knowledge of the effects of engineering practices and the standards used in these practices on society, health and safety, economy, sustainability and environment within the scope of the UN Sustainable Development Goals; awareness of the consequences of engineering solutions in the fields of information security and law.					
7	Acting in accordance with engineering professional principles and knowledge on		x			

		ethical responsibility; awareness of acting impartially, without discrimination on any issue, and being inclusive of diversity.					
	8	Ability to work effectively individually and as a team member or leader in intradisciplinary and multidisciplinary teams (face-to-face, remote, or hybrid).			x		
	9	Ability to conduct effective verbal and written communication on technical issues in Turkish or English, prepare reports, make effective presentations and prepare software documentation, considering the various differences of the target audience (such as education, language, profession).				x	
	10	Knowledge of business practices such as project, risk and change management and economic feasibility analysis; awareness of entrepreneurship and innovation.		x			
	11	Lifelong learning skill that includes the ability to learn independently and continuously, to adapt to new and developing scientific practices and technologies, and to think inquisitively about technological changes.		x			
Lecturer(s) and Contact Information	Lecturer's First/Last Name: Assoc. Prof. Dr. Murat YILMAZ E-mail address: my@gazi.edu.tr						