



T.C.

ESKİŞEHİR OSMANGAZİ ÜNİVERSİTESİ

FACULTY OF SCIENCES

MATHEMATICS AND COMPUTER SCIENCES DEPARTMENT



COURSE INFORMATION FORM

Course Name	Course Code
Game Theory	821617009

Semester	Number of Course Hours per Week		Credit	ECTS
	Theory	Practice		
7	3	0	-	5

Course Category (Credit)				
Basic Sciences	Engineering Sciences	Design	General Education	Social
x				

Course Language	Course Level	Course Type
Turkish	Undergraduate	Elective

Prerequisite(s) if any	
Objectives of the Course	The aim of the course is to endow students with advanced game theoretical tools and provide them to apply these tools .
Short Course Content	Matrix games: Definations and basic concepts, 2×2 games, $2 \times n$ games, $m \times 2$ games, $m \times n$ games, diagonal games, symmetric games. Infinite antagonistic games: Equilibrium situations, optimal strategies, conditional compact games, continuous games in unit square, convex games. Games without a partner: Nash theorem. Partnership games: characteristic functions, imputations and dominance, kernel of the game, von Neumann-Morgenstern solutions, Shapley vector. Stage games: behavior strategies, depletion games, stochastic games, repeated games.

Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1 Student learns fundamental concepts about game theory.	1,3,6	1,2,5	A
2 Student understands relation between game theory and other science branches.	3,7	1,2,5	A
3 Student understands applications of game theory in other science branches.	3,7	1,2,4,5	A
4 Student realizes responses of game theory in real life.	8,12,15	1,2,4,5	A
5 Analytical thinking skills and the ability to make individual and independent decisions of student develops.	8,9	1,2,5	A
6 Ability to analyze and solve problems encountered of student develops.	4,9,13	1,2,5	A
7 Student learns computer applications of game theory.	5,8,13	1,2,5	A
8 Ability to construct algorithm of student develops with game theory.	5,8,13	1,2,4,5	A

*Teaching Methods 1:Expression, 2:Discussion, 3:Experiment, 4:Simulation, 5:Question-Answer, 6:Tutorial, 7:Observation, 8:Case Study, 9:Technical Visit, 10:Trouble/Problem Solving, 11:Individual Work, 12:Team/Group Work, 13:Brain Storm, 14:Project Design / Management, 15:Report Preparation and/or Presentation

**Measuring Methods A:Exam, B:Quiz, C:Oral Exam, D:Homework, E:Report, F:Article Examination, G:Presentation, I:Experimental Skill, J:Project Observation, K:Class Attendance; L:Jury Exam

Main Textbook	Mehmet Ahlatçioğlu, Fatma Tiryaki, Oyunlar Teorisi, YTÜ Yayın No: YTÜ.FE.DK-98.0343, İstanbul-1998.
Supporting References	Emrah Akyar, Khalik G. Guseinov, Serkan A. Düzce, Oyun Teorisi, Seçkin Yayınevi, 2010.
Necessary Course Material	-

Course Schedule	
1	Matrix games: Definitions and basic concepts
2	Min-max theorem, 2×2 games, $2 \times n$ games
3	$m \times 2$ games, $m \times n$ games
4	Diagonal games, symmetric games, various applications
5	Infinite antagonistic games: Equilibrium situations, optimal strategies
6	Conditional compact games, continuous games in unit square, convex games, various applications
7	Games without a partner: Nash theorem.
8	Mid-Term Exam
9	Prisoners' dilemma, of the sexes and various applications
10	Kernel of the game, von Neumann-Morgenstern solutions
11	Shapley vector, various applications
12	Stage games, behavior strategies
13	Depletion games
14	Stochastic games, repeated games
15	General reputation
16,17	Final Exam

Calculation of Course Workload			
Activities	Number	Time (Hour)	Total Workload (Hour)
Course Time (number of course hours per week)	14	3	42
Classroom Studying Time (review, reinforcing, prestudy,...)	14	3	42
Homework			
Quiz Exam			
Studying for Quiz Exam			
Oral exam			
Studying for Oral Exam			
Report (Preparation and presentation time included)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	20	20
Final Exam	1	2	2
Studying for Final Exam	1	30	30
	Total workload		
	Total workload / 30		
	Course ECTS Credit		5

Evaluation	
Activity Type	%
Mid-term	40
Quiz	
Homework	
Bir öge seçin.	
Bir öge seçin.	
Final Exam	60
Total	100

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	PROGRAM OUTCOME	Contribution
1	The ability to apply knowledges of Mathematics and Computer Sciences,	5
2	To have sufficient theoretical and practical knowledge of Mathematics at international level,	4
3	The ability of describing, modelling and solving of mathematical problems at Mathematics and related subjects,	5
4	The skill to solve and design a problem process in accordance with a defined target,	4
5	Skills to analyze data, interpret and apply to other datum and using these data on computer,	4
6	The skill to use the modern techniques and computational tools needed for mathematical applications,	3
7	The skill to make team work within the discipline and interdisciplinary,	3
8	The ability to improve oneself by following the developments on other modern, scientific and technological subjects as well as Mathematics and Computer Sciences,	4
9	The skill to communicate orally and in written way, in a clear and concise manner by having individual work skills and ability to independently decide and analytical thinking,	5
10	The skill to have professional and ethical responsibility,	2
11	The skill to have consciousness for quality issues and scientific research,	5
12	The skill to be sensitive to environmental issues related with problems and development of living area and consistent in the social relations,	1
13	Ability to solve problems in the working life faced to find an appropriate algorithms via mathematical modeling and to write computer programs,	4
14	The skill to developed design of software systems at different complex levels,	1
15	The credence of necessity of life-long learning and ability to apply the formation long-life learning.	2

LECTUTER(S)				
Prepared by	Doç. Dr. Ömer Ünsal			
Signature(s)				

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