

**IKT 415**  
**Game Theory**  
SUMMER 2019

**Instructor:** Ethem Akyol, **e-mail:** eakyol@etu.edu.tr, akyoletthem@gmail.com

**Office Hours:** Tuesdays: 11.30-12.30

Thursdays: 14.30-15.30

If office hours do not fit into your schedule and want to see the instructor, please make an appointment via e-mail.

**Time and Location:** Tuesdays: 13:30-15:20, Classroom: 309.

Thursdays: 16:30-18:20, Classroom: 308.

**Course Overview:** Standard economic theory assumes price-taking behavior: Agents do not influence the environment that they operate and they just try to maximize their utilities given the environment. That is, the world is “too big”, or, in other words, agents are “too small” that their actions do not influence the environment.

However, this is hardly realistic in many situations. In many situations, agents think and behave *strategically*. They take into account the fact that their actions affect the outcomes and therefore others’ payoffs; and similarly, others’ actions affect their own payoffs. Given these, agents adjust their actions accordingly. *Game theory* analyzes such strategic situations and tells us how “players” should act to maximize their well-beings.

This course is an advanced game theory course. In terms of contents, it is similar to IKT 214 but is at a more advanced level. We will also cover additional topics that are not covered in IKT 214. It is mathematical by nature and you will be expected to know single variable calculus.

**Textbook:** The textbook for the course is:

Osborne, Martin J., *An Introduction to Game Theory*, Oxford University Press (2004)  
(NOTE: We may not closely follow the book.)

You may also benefit from the following books:

Gibbons, Robert, *Game Theory for Applied Economists*, Princeton University Press, 1992

Watson, Joel, *Strategy: An Introduction to Game Theory*, W.W. Norton

Dixit and Nalebuff, *Thinking Strategically*, W. W. Norton (1991)

Dixit, Skeath and Reiley, Jr., *Games of Strategy*, W.W. Norton, 2009, Third edition

Dutta, Prajit K., *Strategies and Games: Theory and Practice*, Second Edition, W.W. Norton

**Attendance:** Students who are absent more than 12 class hours will receive a grade  $U$  and will not be allowed to take the final exam and/or retake exam. Please let the instructor know if you have a valid excuse for your absence within 5 days.

**Exams:** There will be a midterm exam and a final exam. The final exam will be cumulative. The midterm exam is tentatively scheduled on

June 27, 2019

at class hours.

**Homeworks:** There will be a number of homeworks assigned during the semester. You are required to submit your homework on time. Late homeworks will not be accepted. There is no make-up for homeworks. No exceptions.

You are free to discuss homework problems with your classmates but **each student must submit his/her own work**. You should never copy someone else's work. Such actions will be subject to University's disciplinary actions.

**Grading:** Your letter grade will be determined based *only* on your performance in homeworks and exams. There is no chance of additional homeworks, exams, projects and so on except the regular ones. Furthermore, your grade is independent of your class year, graduation status and etc. No discussions will be made for your letter grade based on these. Homeworks, the midterm exam and the final exam will count towards your letter grade as follows:

Homeworks	15%
Midterm	40%
Final	45%

**E-mail Policy:** You may receive important information regarding class material, assignments and/or exams via e-mail. Each student is responsible for checking his/her e-mail regularly to get these information. I will use the "...@etu.edu.tr" e-mail addresses to send these information and assume that e-mails are read within 24 hours.

**Make-Up Policy:** Each student is expected to take the exam at specified dates. You are entitled to receive a make-up exam *only* in the case of a *documented* illness, emergency, etc. **These must be documented and sent to the instructor via e-mail within 5 business days.** No exceptions.

**IKT 415 COURSE OUTLINE**  
(Subject to revisions)

**1. Introduction. What is Game Theory?**

**2. Simultaneous Move games.**

- (a) Complete information. Dominant strategies, Nash Equilibrium, Mixed strategies.
- (b) Incomplete Information. Bayesian Games, Bayesian Nash Equilibrium
- (c) Applications: Auctions

**3. Sequential Move Games.**

- (a) Perfect information. Backward Induction. .
- (b) Imperfect information. Subgame Perfect Equilibrium.
- (c) Applications: Bargaining, Repeated Games.
- (d) Incomplete Information. Perfect Bayesian Equilibrium.