

## COURSE INFORMATION

**Instructor:** Mehmet Barlo

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**Office Hours:** By appointment.

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**Course web-page:** SUCourse+

**Class:** Monday 14:40 - 15:30 FASS G018; Wednesday 14:40 - 16:30 – FASS G018

**Recitation:** Friday 14:40 - 15:30 – Online

## COURSE OBJECTIVES

This course introduces formalities in social sciences using the subject of game theory particularly. Game theory consists of a coherent set of concepts and analytical tools to examine interactive or strategic situations between people, that is, situations where the well being of one actor depends not only what s/he does but also on what others do. Hence in deciding how best to act, each person needs to consider how others are likely to act as well. Game theory has become a widely used tool of analysis in a wide range of disciplines, including economics, business, political science, law, and international relations.

I hope that by the end of this course, your point of view (not only the one towards economics but also towards many fields of social sciences) will be refined.

## BACKGROUND

The mathematical requirements of this course are not high, and topics covered under the first-year mathematics sequence (MATH 101 and 102) are more than sufficient to master the content of this course. However, the course requires students to think and reason analytically rigorous and systematic manner. I may review some aspects required if I see fit.

## TEXTS & STUDY MATERIALS

You are not required to buy any book. Your main source will be the notes you take in the lectures, answer keys to homework assignments, handouts and lecture notes that I will be posting to the SU-Course+. On the other hand, some books are useful. I have to tell you that I will not follow a particular book word for word, yet, the below listed books do cover the same material with lots of examples.

- *An introduction to Game Theory*, Martin J. Osborne, Oxford University Press, 2004. Recommended.
- *Game Theory and Economic Modeling*, David Kreps, Oxford University Press, 1991; recommended, it is a very famous book by a well-known game theorist offering a solid introduction to the subject. I will put important parts of it to the reserve at the library if needed.

- *Game Theory for Applied Economists*, Robert Gibbons, recommended, the author is a famous game theorist, and the book is well organized. That is a very good book that you want to keep for your library. However, its formal requirements are higher than the other three books.
- Homework answer keys and lecture notes posted at SUCourse+ website.

## COURSE CONDUCT & METHODOLOGY

Due to the decision of Sabanci University, **our course will be conducted in hybrid style – both physically (on the campus) and online**. The details of the *hybrid* system I intend to employ emerge as follows:

- All of our lectures are to be conducted **synchronously** and (if the pandemic permits) in **FASS G018** as long as otherwise announced via the SUCourse+ system.
- For each of our physical lectures, we will have a **recorded Zoom meeting**, which will be broadcast live to its participants. Indeed, the online participants will have the opportunity to interact with the physical participants (asking questions, engaging in discussions, etc.).

The record of the Zoom meeting will be shared with the class via the SUCourse+ system.

- There will be weekly **recitations** conducted **online** by Gizem Kılıçgedik, the ECON TA assigned to our course. Your TA will arrange a recorded Zoom meeting every week and share the recording via the SUCourse system.

The recitations will start in the third week of our course (and hence, there are no recitations in the first two weeks of the course).

- You are supposed to join these meetings (both the lectures and the recitations) either physically or online.

Nevertheless, all our meetings will be recorded, and these recorded Zoom meetings will be available online for those of you who missed them. Still, I need to stress that your participation is strictly expected!

Consequently, our course is closed to time conflict permits. If you cannot graduate without taking this course at the end of this semester (Spring 2022), please contact the Dean's office of the faculty you are registered to. I could register you to this course if you were to get their confirmation and approval.

- My advice for you is to follow this course on a timely basis and work every week as the course progresses. If you wait, do not follow the course and accumulate materials, do not come to our meetings to ask questions, and study just before the examinations, then it is highly probable that you will not show a strong performance.

Hybrid teaching methods, I think, are very efficient for those students who want to learn. Therefore, please regard this as a *fair warning* urging you to come to our meetings, work on time, and follow the course.

I trust your rationality in that regard. That is why I will not restrict access to our videos as the course progresses. So, I will not use a policy in which the lecture videos disappear after some time (e.g., a week or two weeks).

- The examinations of this course will be conducted adhering to the regulations called for by our university. Currently, all midterm and final examinations are to be conducted physically. However, this can change due to the pandemic. If so, we will be bound by the regulations/demands of our university. In that regard, make sure to follow the university's respective announcements and my announcements via the SUCourse+ system.

## GRADING

- **Attendance** is essential in this course.

That is why I expect each student to be present in every synchronous lecture (either physically or online) of this course. Moreover, according to YÖK regulations, we have to take attendances for both the physical and the online participation into our lectures. Thus, the attendance figures will be quite transparent at the end of the class.

- **Take-Home Examinations:** (%30 of grade) There will be 3 take-home examinations, each with a due date of 2 weeks. Here are some important issues concerning take-home examinations:

- Students are encouraged to work together. Thus, come together and do the questions in a group. BUT, no outsiders under any circumstances! This cooperative work permit extends only to your fellow students. If I catch you getting your homework done by an outside party (with or without compensation), I will pursue this with all the disciplinary regulations available.

Notice that these are not homework assignments but take-home examinations. Thus, according to YÖK regulations, they are *subject to disciplinary regulations*.

- Each student has to **submit his/her work separately**. I will not accept “group answers”. Those who submit such work will get 0 from that particular work.

- The front page of the work **MUST** contain all the names of the students you worked with. These names have to be listed in a “*list of collaborators*”.

- As the answer keys will be posted online at the due date, **no late take-home examinations will be accepted**. This is a strict rule, so please adjust yourselves accordingly.

- **Midterm:** (%30 of grade) There will be **one midterm**.

The midterm will cover all the subjects up to the beginning of the extensive-form (dynamic) games.

The particular timing of the midterm will be determined together with the students in the class. Moreover, the details of the procedures to be applied in connection with the midterm will be announced via SuCourse+ before the exam.

- **Final:** (%40 of grade) The final will be comprehensive –covering all the subjects– and will be administered on the date announced by the ÖK.

The procedure to be applied in conjunction with the final will be announced via SuCourse+ before the exam.

## COURSE CONTENT

Students will be responsible only for the material they see in the lectures. So, they will not be responsible for subjects not covered in the lectures. And now the list of topics to be covered:

- Introduction to strategic interactions and their classifications;

- Definitions of normal-form games and modeling strategic interactions via such constructs in general; utilization of this formulation on many examples;
- Analysis of the implications of (individual) rationality: strict and weak domination, associated equilibrium concepts, pure strategy best responses, and pure strategy Nash equilibrium;
- Evaluation of these pure strategy equilibrium notions; identification of the problem of existence;
- Mixed strategies (randomized behavior) in normal-form games, mixed strategy best responses, and mixed strategy Nash equilibrium;
- Many examples: Cournot and Bertrand oligopolistic competition, bargaining, wars of attrition, games of timing, public good provision, ...
- Evaluation of Nash equilibrium;
- **MIDTERM**
- Dynamic games of perfect information, definitions, actions versus strategies;
- Nash equilibrium, non-credible threats, dynamic rationality, and subgame perfect equilibrium (via backward induction);
- Many examples: von Stackelberg competition, the centipede, chain-store paradox, ...
- If time allows, we continue into
  - Simultaneous-move games of imperfect information and Bayesian Nash equilibrium;
  - Examples...

## POLICIES: EXAMINATIONS AND SCHOLARLY CONDUCT

1. Take-home examinations should be turned in by the announced deadline. Our policy is strict and decrees that *no late take-home examinations will be accepted*.
2. All answers to take-home examinations, midterm, and the final must be neatly and clearly written. The grader is the final judge of what is legible and may request specific students to type their work.
3. Collective and cooperative work on take-home examinations is strongly encouraged. However, any take-home examination *must* be written up separately by the owner of it. Additionally, any take-home examination *must* contain the list of the fellow students with whom the work was done under the heading “List of Collaborators”.

Notice that students are encouraged to work together. However, this does not extend to outsiders under any circumstances! The cooperative work permit is for your fellow students only. If I catch instances of a student getting his/her homework done by an outside third party (with or without compensation), I will pursue this with all the disciplinary regulations available. In that regard, notice that these are not homework assignments but take-home examinations. Thus, according to YÖK regulations, they are subject to disciplinary practices.

4. During physical midterm and final examinations (and their make-up examinations if granted), all students are to prove their identity (via a formal id card) and sign the attendance sheet, which will be taken by the proctor(s) of the examination. At the end of the examination, every student (whose name appears on the attendance sheet) has to turn in their work. Failure to do so counts as a violation of rules (*Kural İhlali*). It would result in the draft of the so-called *Kural İhlal Tutanağı* that may result in disciplinary consequences.

On the other hand, during online midterm and final examinations (and their make-up examinations if granted), the attendance sheet will be taken by the proctor(s) of the examination using the Zoom participation list. That is why every student has to join the Zoom meeting of the examination with their formal “sabanciuniv.edu” email account.<sup>1</sup> Students’ ids will be recorded (into the online Zoom meeting recording) by asking them to show their faces and formal id cards to the camera. In furtherance, during online midterm and final examinations (and their make-up examinations if granted), the student’s webcam must always be on. Otherwise, the examination at hand will be void. At the end of the examination, every student (whose name appears in the Zoom participation list) has to turn in their work. Failure to email the exam paper to the instructor and/or proctor counts as a violation of rules (*Kural İhlali*). It would result in the draft of the so-called *Kural İhlal Tutanağı* that may result in disciplinary consequences.

5. Make-up exams are granted only in case of a valid and documented reason. Absence in exams without any valid and documented excuse will result in a grade of 0 from that exam. In case of an illness or other documentable excuses, the student is required to contact me within three business days with a petition summarizing his/her situation and preferably presenting documentation for their excuses.<sup>2</sup> I will also accept a formally written email from the sabanciuniv.edu email address of the student, and hence the petition does not have to be physical. The documentation could be in the form of a formal doctor’s note from a state hospital<sup>3</sup> or police/insurance report in case of a minor traffic accident providing details; and so and so forth. All verified documentation has to be submitted physically in three business days following the expiration of the excuse or the verification date. If the instructor finds the student’s excuse valid, then either a make-up examination will be arranged, or the corresponding points from that examination will be shifted to the consequent examination. I wish to emphasize that due to YÖK regulations, I have to be quite strict about these formalities.
6. A student who fails to show up for the final examination without a valid excuse is not eligible to take the make-up of that examination, and will receive N/A (and not F) as his/her final grade. Moreover, we adopt the following *grading policy*: A student who does not show up for the midterm examination without a valid excuse and does not hand in three or more take-home examinations without valid excuses will not be eligible to enter the final and will receive a N/A as his/her final grade.
7. The definition for scholastic dishonesty is as given in the rules and regulations/announcements of the Sabancı University and include aspects concerning online evaluation/examination practices.
8. In case of scholastic dishonesty, no credits will be given for that particular work. Cheating during written work will result in an F for the course. All incidents of scholastic dishonesty will be reported to FASS.

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<sup>1</sup>Students are not allowed to utilize other emails unless explicitly permitted by the instructor.

<sup>2</sup>These regulations are from the “Sabancı Üniversitesi Lisans Eğitim ve Öğretim Yönetmeliği” – *Resmî Gazete No: 29607 Tarih: 28 Ocak 2016* Madde 22-2-a.

<sup>3</sup>A doctor’s note taken from a doctor’s private practice does not count as formal. In the case of private hospitals, the doctor’s note has to be verified by the university health service within five business days following the expiration date of the doctor’s note.