

ECON607 - GAME THEORY - SPRING 2023
SABANCI UNIVERSITY – FACULTY OF ARTS AND SOCIAL SCIENCES

COURSE INFORMATION

Instructor: Mehmet Barlo

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Zoom Meetings: Zoom id: “449 133 2874”; Pass: “ECON607S23”:

<https://sabanciuniv.zoom.us/j/4491332874?pwd=TFE5dURNYkRLY2haNXN1S3J2LzMyZz09>

Class Administration: Wednesdays 08:40 – 11:30 to be broadcast from **FASS 1099**.

COURSE OBJECTIVES

This course aims to work on formal models of non-cooperative games and implementation. The emphasis will be on (full) implementation and its extensions to bounded rationality.

BACKGROUND

The students should have taken a master’s level microeconomics course and be familiar with basic notions of mathematical analysis.

TEXTS

- Lecture **notes** to be sent via the SU Course system.
- Various **papers** to be sent via the SU Course system.
- **Books:** [Myerson \(1997\)](#), [Osborne and Rubinstein \(1994\)](#), [Mas-Colell et al. \(1995\)](#), and [Van Damme \(1991\)](#).

COURSE CONTENT & METHODOLOGY

The course features two parts. The list/order of subjects to be covered in the **first part** is:

- Behavior under uncertainty, acts, lotteries, von Neumann and Morgenstern expected utility theorem, Savage's subjective utility theorem;
- Normal-form games under perfect information; behavioral formulation with choice correspondences: best responses, opportunity sets, behavioral Nash equilibrium, weak and strong behavioral domination; rational formulation under von Neumann and Morgenstern expected utility setting: weak and strong domination, best responses and their linearity properties, Nash equilibrium in mixed strategies.
- Existence of Nash equilibrium in normal-form games of perfect information; properties of Nash equilibrium: Pros/Cons, upper-hemi-continuity of the Nash equilibrium correspondence, stability (lower-hemi-continuity) of Nash equilibrium.
- Refinements of Nash equilibrium: Perfect equilibrium, its existence, and properties; Proper equilibrium, its existence, and properties; Other refinement notions: Persistent equilibrium, essential equilibrium, tenacious selection of Nash equilibrium.
- Normal-form games under imperfect information (under von Neumann and Morgenstern expected utility setting): Probabilistic sophistication, Bayesian Nash equilibrium, its properties, and existence; Some basic examples: Contacts, auctions; Weak domination and its implications.
- Normal-form games under incomplete information (under behavioral formulation with choice correspondences over acts) under interim considerations: Interim equilibrium, ex-post equilibrium, the sure thing principle, and relating ex-post and interim considerations.

We will have our **first midterm examination** (an in-class closed-book examination) after the end of the first part, which will be around the 7th to 8th week of the semester. Following the midterm, in the **second part**, we will cover the following papers in detail:

- Classic full implementation in Nash equilibrium under complete information: [Maskin \(1999\)](#), [Moore and Repullo \(1990\)](#), and [Dutta and Sen \(1991\)](#);
- Behavioral implementation in behavioral Nash equilibrium under complete information: [Hurwicz \(1986\)](#), [Korpela \(2012\)](#), [de Clippel \(2014\)](#), [Yegane \(2018\)](#), [Hayashi et al. \(2020\)](#), and [Barlo and Dalkıran \(2022\)](#);
- Implementation under honesty: [Dutta and Sen \(2012\)](#), [Kartik and Tercieux \(2012\)](#), [Lombardi and Yoshihara \(2018\)](#), and [Altun et al. \(2023\)](#);
- Implementation with incomplete information: [Jackson \(1991\)](#), [Bergemann and Morris \(2008\)](#), and [Barlo and Dalkıran \(2022\)](#).

Around the 11-12th week of the semester, we will have our **second midterm examination** (an in-class closed-book examination). To conclude, we will have a **final examination** (also an in-class closed-book examination) during the finals week as will be arranged by the university.

I advise you 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, and do not attend our meetings, then it is almost certain that you will not show a strong performance. So, please regard this as a *fair warning* urging you to attend our meetings, work on time, and follow the course.

I expect each student to be present (virtually or physically) in every lecture of this course.

Our lectures will be done virtually (via Zoom meetings, the details of which are on the first page) physically broadcast from FASS 1099. *I will not be leaving recorded lectures*; you will have to be present (virtually or physically) during the lectures.¹ As a result, I will take formal (Zoom and physical) attendances in each lecture of this course. That is why you will have to log in to the Zoom meetings via your formal sabanciuniv.edu account unless explicitly permitted otherwise by me. Please contact me in such situations in advance.

Further, please note that we may have to revise the course plan according to YÖK's decrees expected at the beginning of April. The content to be delivered is certain, but the course delivery method, the number and dates of examinations, and other relevant details are subject to change to comply with the updated regulations. In such cases, the necessary and relevant announcements will be made in such cases via SuCourse+.

GRADING

- **Attendance** is essential and **mandatory** in this course.
- **Midterms:** ($2 \times 30\%$ of grade)
- **The final examination:** (40% of grade)
- We adopt the following **grading policy**: A student who fails to show up for one or more midterm (or its make-up) examinations and the final (or its make-up) examination without valid excuses will receive N/A (and not F) as his/her final grade.

POLICIES: EXAMINATIONS AND SCHOLARLY CONDUCT

1. All answers to the midterms 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.

¹Please contact me for an exception to this rule if you are a student who is affected directly (and/or has a directly related relative affected directly) by the recent earthquakes.

2. 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. Every student (whose name appears on the attendance sheet) has to turn in their work at the end of the examination. Failure to do so counts as a violation of rules (*Kural İhlali*) and would result in the draft of the so-called *Kural İhlal Tutanağı* that may result in disciplinary consequences.²
3. 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. I will also accept a formally written email from the student's sabanciuniv.edu email address; 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 hospital³ 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 must be quite strict about these formalities.
4. A student who fails to show up for one or more midterm (or its make-up) examination(s) and the final (or its make-up) examination without a valid excuse will receive N/A (and not F) as their final grade.
5. The definition of scholastic dishonesty is as given in the rules and regulations/announcements of the Sabancı University and include aspects concerning online evaluation/examination practices.
6. 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 for disciplinary action.

²On the other hand, during online midterm and final examinations and their make-up examinations if granted (in case that online examinations are needed and demanded by the Sabancı University), 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. Students cannot utilize other email accounts unless explicitly permitted by the instructor. Students' ids will be recorded (in the online Zoom meeting recording) by asking them to show their faces and formal id cards to the camera. Further, 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. Every student (whose name appears on the Zoom participation list) has to turn in their work at the end of the examination. Failure to email the exam paper to the instructor and/or proctor counts as a violation of rules (*Kural İhlali*) and would result in the draft of the so-called *Kural İhlal Tutanağı* that may result in disciplinary consequences.

³A 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.

References

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