

ECO3101 – Game Theory and Applications

Professor Jin Yeub Kim

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Class Time and Teaching Method

Mondays 3,4 (11-12:50) / Wednesdays 4 (12-12:50) – offline lectures

Target Students

Junior and senior undergraduate students.

Course Description and Goals

This course introduces students to the basic ideas and applications of game theory. This course begins with expected utility theory, and then introduces the fundamental ideas of game theory: strategic-form games, Nash equilibrium, games with incomplete information, extensive-form games, sequential equilibrium, repeated games, as well as games with communication.

Prerequisite

Microeconomics, Mathematics for Economics, Introduction to Statistics, Calculus.

Office Hours and Communications

For office hours, see Course Structure below.

If you would like to discuss anything related to the course with me, please send me an email.

Email responses will generally be made between 9:00 a.m. and 5:00 p.m. on weekdays. Responses on weekends, national and university holidays should not be expected. When sending email, the “subject line” should contain **the course name ECO3101 and your full name**, and it must be written in **English**; otherwise, I will not respond.

English is the only language of communication throughout the course unless you would like to discuss academic-related but non-class-related matters with me.

Course Web Site

Announcements, lecture note, problem sets, and related materials will be available through the course website on the LearnUs system. Please check the website regularly. I will also send you messages from the web site from time to time.

Texts and References

➤ Lecture Note

➤ R. Myerson, *Game Theory*, Harvard U Press (1991), chapters 1-4, (6, 7, 10).

This textbook is especially useful both for a treatment of much of the material we will cover and for background material not covered in class.

Course Structure (Requirements and Optional Participation)

1. **Lectures:** Mondays Periods 3 & 4 and Wednesdays Period 4
 - A. In the event of unexpected national-wide disasters, depending on the level of social-distancing rule in the metropolitan area of Seoul, lectures may be substituted by pre-recorded lecture videos or real-time ZOOM sessions.
 - B. Should we need make-up or additional class time, we will coordinate the time.
2. **Midterm and Final Exams:** There will be two exams.
 - A. Midterm exam is scheduled on Monday, April 24, 2023, 11:00 a.m.-12:50 p.m.
 - B. Final exam is scheduled on **Wednesday, June 14**, 2023, 11:00 a.m.-12:50 p.m.
 - C. The dates and times are subject to change, and will be notified in advance.
 - D. Both exams will be conducted offline otherwise notified.
3. **[OPTIONAL] Attendance:** Attendance will only be considered per the University policy (Students who are absent for more than 1/3 of the semester will automatically fail the course).
4. **[OPTIONAL] Problem Sets and In-Class Quizzes:** To apply concepts covered in the course, students will be asked to do problems sets (approximately seven) and in-class quizzes (approximately four to five). Both problem sets and in-class quizzes are not graded. You are strongly encouraged to work on problem sets and work together with your classmates.
5. **[OPTIONAL] Office Hours:**
 - A. Office hours every **Monday 3-4 p.m. and Wednesday 1-2 p.m.**, starting Week 2.
 - B. Separate office hours (offline or ZOOM) can be scheduled by appointment.
6. **[OPTIONAL] Participation:** Students are strongly encouraged to utilize class lectures, office hours as well as the Q&A board on LearnUs course website to ask questions about lectures, problem sets, etc.

Grading Policy

Exams: The scores of the two exams will be normalized to z-values. The higher of the two z-values will account for 65% and the other one for 35% toward course letter grade. (Absolute evaluation.)

Class participation: Students' active class participation is strongly encouraged and expected. Depending on class participation (for example, answering questions voluntarily or upon cold-called during class, doing in-class quizzes when called upon, actively utilizing office hours or Q&A board on LearnUs to ask questions and discuss, etc.), extra credit points may be added. If you are on a grade margin, then your extra credit points may push your letter grade over the line.

Other Rules for Exams

- ✓ Two exams must be taken at the specified day and time. If you are absent from either one, you will get an F.
- ✓ In the event of an emergency or tragedy such as the death of an immediate family member, an accident, illness or injury, or other circumstance beyond control that requires temporary leave from the campus, you may request an exam rescheduling, but a student needs to provide documentation that supports the reason for absence such as the order of service from a funeral, police report, hospital discharge, doctor's note, etc.

- ✓ Even in the event of an emergency or tragedy, no request for exam rescheduling will be entertained after the exam has commenced unless you are in a coma, abducted, or in a similar situation in which you are absolutely beyond control to reach me before the exam.
- ✓ Requests for re-grading of exams are usually not accepted unless there are clerical errors. You may, of course, ask me for clarifications on why you got points deducted on your answers from certain questions. If you feel a need for re-grading, requests must be submitted in writing within 24 hours of the exam being seen; the entirety of the exam will be subject to re-grading. You must carefully explain what you think is wrong with the grading. The regrading requests must refer to a potential mistake in the grading, not feelings about the grading criteria. For example, a request stating that you feel that a question was graded too harshly and you were not given enough partial credit is very likely to be rejected.

Honor Code

Students in this course must adhere to the *Student Code of Conduct* (“학부대학 학생지도 시행세칙”). Any plagiarism or academic dishonesty will be strictly punished according to the *Code of Conduct for Academic Dishonesty and Misconduct* (“부정행위에 대한 처리 지침”). The codes can be found on <https://rules.yonsei.ac.kr>.¹

For Underwood International College (UIC) students, the *UIC Honor Code* also applies, which can be found on pp. 149-150 in *Curriculum & Academic Regulations 2020* available at https://uic.yonsei.ac.kr/main/academic.asp?mid=m03_02_10.

The list of violations and corresponding punishments can be found at the end of this document as [Appendix 1] *Criteria for Punishments for Academic Dishonesty and Misconduct* (“[별표 1] 부정행위에 대한 처벌기준”) or at <https://rules.yonsei.ac.kr/linkfile/2200000068177/1>. In the following, I listed some, but not all, of the standards of academic dishonesty and misconduct:

1. **Cheating**, which includes, but is not limited to:
 - A. Copying from another student’s exam, assignment, or project.
 - B. Using materials or devices during an exam that are not authorized by the instructor.
 - C. Taking any materials out of the exam “room” that the exam instructions prohibit students from taking.
 - D. Making an electronic copy of part or all of an exam unless the instructions authorize making a copy.
 - E. Possessing a copy of an exam or assignment that the student knows or should have known that they are not authorized to have.
 - F. Working on an exam or assignment with someone else, unless group work has been authorized by the instructor.
 - G. Taking an exam for another student, or allowing their exam to be taken by someone else.
 - H. Taking all or part of work that someone else prepared and submitting it as one’s own.
 - I. Taking all or a substantial part of an assignment submitted for one course and submitting it in another course, without the authorization of the instructor for that course.
2. **Dishonesty, Falsification, and Fabrication**, which includes, but is not limited to:

¹ These codes are in Korean. Please contact the College Administration Team (“학부대학 행정팀”) at 032-749-3126 or the Academic Support Team in the Office of Academic Affairs (“교무처 학사지원팀”) at 02-2123-2095 for an English translation of the codes.

- A. Making false statements to avoid taking an exam or submitting an assignment at the scheduled time.
 - B. Making false statements to avoid a penalty for failing to take an exam or submit an assignment at the scheduled time.
 - C. Engaging in plagiarism by presenting the words or ideas of another person as one's own.
3. **Improperly Helping Others**, which includes, but is not limited to:
- A. Helping another student on an exam or an assignment when the student is not authorized to receive help.
 - B. Knowingly helping another student violate these standards, including, but not limited to sharing an instructor's teaching materials without permission.
 - C. Unauthorized distribution, electronically or otherwise, of an instructor's course material, including purchasing, selling, trading, giving, or receiving assignments, exams, answers to exams, etc.

Each student shall sign the following pledge on all work: ***"I pledge my honor that I have not violated the student code of conduct during this assignment or examination."***

By taking this course, you are agreeing to abide by the honor code. The penalties for academic dishonesty and misconduct will be severe. **Any student violating the honor code will get an F for this course, and the incident will be reported to the student's department chair/dean for further sanctions.** Possible sanctions include probation, temporary suspension, and/or permanent suspension.

Accommodation Policy

Students with disabilities are encouraged to contact their professor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University to provide flexible and individualized accommodation to students with documented disabilities. To receive accommodation services, students must be registered with the University. Please refer to the *Rules for Supporting Students with Disabilities* ("장애학생 지원에 관한 규정") or contact the Services for Students with Disabilities ("윤리인권위원회 장애학생지원센터") at 02-2123-3633.

Non-Discrimination Policy

Throughout the course, the instructor desires to create an environment for all students that is fair and responsible—an environment where distinctions are made on the basis of ability and performance. To that end, it is the policy of the instructor to administer all pedagogies in a manner which does not discriminate because of an individual's age, gender, gender identity, sexual orientation, marital status, disability, race, color, national or ethnic origin, religion, veteran's status, socioeconomic status, geographic region, or political affiliation. Any such concerns or complaints may be discussed with the instructor.

Recording Policy

Video-recording my lectures is not allowed. You may ask me for permission to voice-record my lectures. If you want to take a screenshot or a picture of particular statements, equations, or graphs during class, please just let me know. In any case, lecture recordings and the likes are not to be copied, reproduced, traded with or without money, distributed publicly or to be used

commercially; in such circumstances, appropriate academic consequences as well as legal procedures will follow in accordance with the *Protection of Communications Secrets Act* Article 3 Paragraph 1 and Article 16 Paragraph 1 (“통신비밀보호법 제 3 조 제 1 항 및 제 16 조 제 1 항”).

Plan of Topics

Below is a rough outline of the course. You should anticipate a few mid-course adjustments once we are underway.

- Week 1: Introduction / Expected utility theory, domination, duality
- Week 2-4: Dominated strategies, strategic-form games and Nash equilibrium
- Week 5-7: Incomplete information games
- Week 8: Midterm exam period
- Week 9-12: Extensive form games and sequential equilibrium
- Week 13: Auctions / Repeated games
- Week 14: Games with communication (mediation and incentive constraints)
- Week 15-16: Self-study / Review / Final exam period

[Appendix 1] Criteria for Punishments for Academic Dishonesty and Misconduct²

[별표 1] 부정행위에 대한 처벌 기준

1. 다음 중 어느 하나에 해당하는 경우, 당해 평가는 0점으로 하고, 근신의 처분을 부과한다.

If a student's act falls under any of the following conduct, the student will get zero in the corresponding evaluation and will be on academic probation.

가. 시험 중에 옆을 돌아보는 경우

Looking around during an exam.

나. 시험 중 옆 사람과 이야기를 한 경우

Communicating with another student during an exam.

다. 기타 이에 준하는 경미한 부정 행위

Any other minor cheating or academic misconduct similar or equivalent to any of the above.

2. 다음 중 어느 하나에 해당하는 경우, 당해 교과목은 0점으로 하고, 유기정학의 처분을 부과한다.

If a student's act falls under any of the following conduct, the student will get zero in the corresponding course and will be temporarily suspended.

가. 시험 중에 출제된 문제와 관련하여 다른 응시자와 소통한 경우

Communicating with another student regarding exam questions during an exam.

나. 다른 응시자에게 답안지를 보여주거나 보고 쓰거나, 또는 보여달라고 강요한 경우

Showing one's exam to another student; copying from another student's exam; or, threatening or forcing another student to show one's exam.

다. 시험 중 참고 및 열람이 금지된 서적, 노트 등을 이용하여 답안지를 작성하거나, 사용이 금지된 전자 기기나 통신기기를 사용한 경우

Using materials or devices during an exam that are not authorized by the instructor.

라. 강의실 벽이나 책상 등에 답안을 미리 작성해 둔 경우나, 그러한 자리에 앉은 경우

Writing answers on classroom walls or desks in advance, or seating on such spot.

마. 승인 없이 시험지를 무단으로 유출한 경우

Taking any materials out of the exam room that the exam instructions prohibit students from taking.

바. 시험 중 감독자의 승인 없이 스마트폰, 통신기기 등 전자기기의 전원을 켜서 휴대하고 있는 경우

Having electronic devices such as smart phones and communication devices on during an exam that are not authorized by the proctor.

사. 온라인시험 중 2대 이상의 단말기에서 한 아이디로 중복하여 로그인하는 경우

Logging in multiple times with one id using two or more devices during an online exam.

아. 온라인시험 중 감독자의 승인 없이 시험 프로그램 이외의 프로그램을 사용하거나 사용이 제한된

² This is an informal English translation done by Professor Jin Yeub Kim .

특수 키(Alt, Ctl, Function 키 등)를 사용하는 경우

Using software programs that are not authorized by the proctor or using special keys on keyboards (e.g., Alt, Ctl, Function Keys) that are restricted during an online exam.

자. 실시간 온라인시험 중 감독관의 승인 없이 감독화면을 이탈하는 경우

Departing from one's proctored screen without an authorization of the proctor during a real-time online exam.

차. 신분증 제시 요구 등 감독자의 정당한 지시에 불응하거나 반항, 항거한 경우

Disobeying, resisting, or dissenting a proctor's fair instruction, such as asking for one's ID.

카. 과제 등 제출물에서 표절하거나 자료를 변조 또는 위조한 경우

Engaging in plagiarism in an assignment or project by presenting the words or ideas of others as one's own.

타. 동일한 과제를 복수의 다른 시험이나 과제에 중복제출한 경우

Taking all or part of an exam or assignment submitted for one course and submitting it in another course.

파. 대리출석한 경우 및 대리출석을 의뢰한 경우

Substituting attendance for another student or asking for their attendance to be substituted by someone else.

하. 기타 이에 준하는 부정행위

Any other cheating or academic misconduct similar or equivalent to any of the above.

3. 다음 중 어느 하나에 해당하는 경우, 당해 교과목은 0점으로 하고, 무기정학의 처분을 부과한다.

If a student's act falls under any of the following conduct, the student will get zero in the corresponding course and will be permanently suspended.

가. 대리시험을 치르거나 치르게 한 경우

Taking an exam for another student, or allowing their exam to be taken by someone else.

나. 사전에 시험문제 또는 답안을 다른 사람에게 알려준 경우

Telling another student about exam questions or answers prior to an exam.

다. 시험답안지를 작성하여 다른 사람의 이름으로 제출한 경우

Writing and submitting one's exam with another student's identity.

라. 과제를 구매하거나 양도한 경우

Unauthorized distribution, electronically or otherwise, of an instructor's course materials, including purchasing or passing assignments.

라. 기타 이에 준하는 중대한 부정행위

Any other serious cheating or academic misconduct similar or equivalent to any of the above.