

# Game Theory, Spring 2024

Lectures: Wed 3:30 PM – 5:00 PM; L7, 3-5, room 001

Instructor: Daniil Larionov

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TA sessions: Wed 5:15 PM – 6:45 PM; L7, 3-5, room 001

TA: Yulia Evsyukova

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Syllabus version: February 14, 2024

## Course description

This is an intermediate-level course in game theory, aimed at undergraduate students. The goal of this course is to provide more advanced technical tools for studying strategic interactions, building on the game-theoretic concepts studied in Micro B.

## Prerequisites

The formal prerequisites for this course are Microeconomics A and Microeconomics B or equivalent. If you have taken other micro courses (e.g. at other universities) and unsure if they are equivalent, you should talk to me. At the very least, I expect you to be familiar with *Nash equilibria* and *subgame perfect equilibria*. I will also presume that you know the basics of calculus and probability theory.

## Textbooks

There is no required textbook for this course. The exam will be solely based on the material covered in class. I will sometimes reference “*An Introduction to Game Theory*” by Martin J. Osborne. Another good standard reference is “*Game Theory: An Introduction*” by Steve Tadelis. A less technical book is “*Game Theory for Applied Economists*” by Robert Gibbons. More advanced textbooks include “*Game Theory*”

by Drew Fudenberg and Jean Tirole, “*Repeated Games and Reputations*” by George J. Mailath and Larry Samuelson, and “*Auction Theory*” by Vijay Krishna.

## Requirements and grading

Your final grade will be based on six problem sets and a final exam, and will be determined according to the following formula:

$$\text{Final grade} = \max\{\text{Exam grade}, 0.7 \times \text{Exam grade} + 0.3 \times \text{Problem sets grade}\}$$

**Problem sets.** Problem sets will appear on my teaching webpage ([daniillari-onov.com/teaching](http://daniillari-onov.com/teaching)) at least two weeks before the due date (except Problem set 1, for which you will have only one week). You should work in groups of four and submit one solution per group. Solutions should be submitted to Yulia at the start of the respective TA session (see the [course outline](#) below for planned dates). Late submissions will not be accepted. If you have a valid excuse for not submitting a problem set, we will not count this problem set toward your final grade. To be considered valid, an excuse has to be provided to Yulia in writing *before* the submission deadline, and be verifiable if possible (these conditions are necessary but not sufficient).

**Final exam.** All the material covered in the lectures and TA sessions will be relevant for the final exam. There will be several exercises. An exercise might ask you to solve a problem or reproduce the proof of a result covered in the lectures, or prove a similar result. The exam will be closed-book, you will however be allowed to bring a *single two-sided A4 formula sheet* with you.

## Course outline

Feb 14	Lecture 1 ( <i>Bayesian games: intro</i> )	
Feb 21	Lecture 2 ( <i>Cournot and Bertrand</i> ) TA session 1	Problem Set 1 due
Feb 28	Lecture 3 ( <i>Auctions I</i> )	
Mar 6	Lecture 4 ( <i>Auctions II</i> ) TA session 2	Problem Set 2 due
<del>Mar 13</del>	<b>No lecture!</b>	
Mar 20	Lecture 5 ( <i>Extensive games: intro</i> ) TA session 3	Problem Set 3 due
<del>Mar 27</del>	<b>Easter break</b>	
<del>Apr 3</del>	<b>Easter break</b>	
Apr 10	Lecture 6 ( <i>Signaling</i> )	
Apr 17	Lecture 7 ( <i>Sequential equilibrium</i> ) TA session 4	Problem Set 4 due
Apr 24	Lecture 8 ( <i>Repeated games I</i> )	
<del>May 1</del>	<b>Labor Day</b>	
May 8	Lecture 9 ( <i>Repeated games II</i> )	
May 15	Lecture 10 ( <i>Repeated games III</i> ) TA session 5	Problem Set 5 due
May 22	Lecture 11 ( <i>Advanced topics I</i> )	
May 29	Lecture 12 ( <i>Advanced topics II</i> ) TA session 6	Problem Set 6 due