Course description

This is an elective course for the 3rd-year students of the joint Higher School of Economics and University of London bachelor program in International Relations. It consists of two large parts:

1) Introduction to Game Theory (fall semester). The main objective of this part of the course is to introduce basic game-theoretic concepts and techniques such as dominating and dominated strategies, Nash equilibrium, backward induction, mixed strategies, coalitional games, imperfect information. The students will learn how to solve simultaneous and sequential games.

2) Applications of Game Theory to all aspects of International Relations, including war, diplomacy, and trade (spring semester). We will apply game theory tools to analyze real-world cases by constructing theoretical models.

Prerequisites

There are no prerequisites for this course. However, a rigorous work during the course is required. Students who attend all classes, participate in discussions, solve home assignments, and complete the course projects will likely get a high grade for the course.

Grading Policy

The final grade G is calculated as a weighted sum of several components:

\[ G = 0.2 \text{ Test1} + 0.2 \text{ Test2} + 0.2 \text{ Referee Report} + 0.2 \text{ Project} + 0.2 \text{ Classroom Activity} \]

Tests 1 and 2 will be held in October and December, respectively. Referee report on a scientific paper and a course project are due in April. I will announce exact deadlines in the class. Late submissions are not possible. Classroom activity mark will be communicated by the instructor at the end of the course. This mark is for participation in discussions, home assignments, and quizzes.

All marks G, Test1, Test2, Referee Report, Project, and Classroom Activity are integer numbers from 0 to 10. Rounding is according to standard math rules.

Cheating

This course implements a zero-tolerance policy for all types of cheating including plagiarism, the use of illegal materials at closed-book tests, etc. If a student is caught cheating, he or she immediately gets a 0 for the corresponding assignment. A report will be submitted to the administration of the Program followed by a formal investigation.
Literature and Online Resources

First half of this course is covered by the following MOOCs:

1. (recommended) Open Yale Courses: Game Theory (Econ 159) by Ben Polak
   https://oyc.yale.edu/economics/econ-159
2. (advanced) Coursera: Game Theory by Matthew Jackson, Kevin Leyton-Brown, Yohav Shoam
   https://www.coursera.org/learn/game-theory-1
3. (supplementary, in Russian) Coursera: Game Theory by Dmitry Dagaev
   https://www.coursera.org/learn/game-theory

The following book is closely related to the second half of our course:


Additional reading:


Topics

Part I. Introduction to Game Theory

Week 1. Strategic interactions

Simultaneous games

Week 2. Dominating and dominated strategies

Weeks 3 and 4. Nash Equilibrium

Week 5. Mixed strategies
Sequential games

Week 6. Backward induction

Week 7. Subgame Perfect Nash Equilibrium

Weeks 8 and 9. Games with imperfect information

Week 10. Repeated games

Other topics

Week 11. Coalitional games

Week 12. Marriage market

Part II. Game Theory and International Relations

Weeks 13 and 14. Bargaining games. The Rubinstein model. International bargaining and conflict (Kydd, Chapter 4)

Week 15. Power change and war. Preventive war (Kydd, Chapter 5)

Week 16. Private information and war. The problem of mistrust (Kydd, Chapter 6)

Week 17. Arms competition (Kydd, Chapter 7)

Weeks 18 and 19. Signaling games and Diplomacy (Kydd, Chapter 9)

Week 20. Domestic politics and international relations (Kydd, Chapter 11)

Week 21. Climate change

Week 22. International organizations: Funding and influence

Week 23. International organizations: Voting and manipulation

Weeks 24 and 25. International trade. Competitive advantages and profits from trade. Trade barriers. WTO

Week 26. International sanctions