

334.190 Quantitative Forschungsmethoden 2

(Thinking Strategically: Psychology, Economics, and Experiments)

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<http://organisation.uni-graz.at>

Office Hours: see UGO



1. Course description

This is a Master-level course (Proseminar) in Organizational Economics and Strategy and provides an introduction into the basics of game theory.

Suppose you are playing tennis. Your rival is at the net and had just volleyed to you on the baseline. You are about to hit a passing shot. Should you play down-the-line or crosscourt? Conventional wisdom favours the down-the-line shot, because the ball has a shorter distance to travel to the net and so your rival has less time to react. However, if you would use this shot all the time, your rival would confidently come to expect it and prepare for it. So the shot would not be so successful. To improve the success of the down-the-line passing shot, you have to use the crosscourt shot often enough to keep your rival guessing on any single instance.

This course will teach you how to think strategically in situations in which you interact with others. Strategic thinking, however, is not only important in playing tennis; it is prevalent in daily life at work and at home. Managers and corporations must use competitive strategies to survive in the market. Parents and kids bargain for pocket money or the assignment of housework. In all these situations it is better to be a good strategist than a bad one. This course aims to help you to improve your skills at discovering and using effective strategies. Good strategic thinking is an art and the science of strategic thinking is called Game Theory:

- On a theoretical level, the course provides an introduction into the basics of Game Theory. In particular, we focus on the basic principles of strategic thinking and apply these principles to different interdependent decision making situations. We illustrate these theoretical insights with movies, case studies and applications from different areas.
- On a practical level, the course focuses on current research in experimental economics. Here, we use the experimental results from the literature in this field to illuminate the validity of our theoretical predictions. Moreover, *you* will use classroom experiments to test and experience *your* interdependent behaviour in the interaction with your classmates. The topics of these experiments range from the sound of silence over tolerating laziness to why gambling the night away.

2. Course outline

In the centre of our discussion in this course are multi-person decision making situations in which the outcomes depend on your action and on the actions of others. In game theory such a situation is called a game and the actors in such a game are called players. To classify the variety of games we consider the following two basic criteria:

1. The degree of conflict: Whenever a group of individuals interacts in a particular situation, individual preferences of these group members may be in conflict. In the tennis game, for example, the players' interests are strictly opposite. When meeting a friend, on the other hand, there is no conflict of interest. In the first case, we speak of games of pure conflict, in the latter one about games of pure cooperation. Between them are games of mixed interests.
2. The degree of behavioural uncertainty: According to this criterion, players can either be determined, unpredictable or ambiguous in their behaviour. An example for the first case arises in team games when team members have mutual interests. The tennis game is an example where players want to be unpredictable in their play. And players are ambiguous in their behaviour if there are several possible ways how they could optimally behave.

Given these two dimensions, we discuss the following classes of games in our course: Prisoners' Dilemma Games, where interests are mixed and players' behaviour is determined; Dis-coordination Games, where players don't want to coordinate their behaviour so that unpredictability is important; Zero-sum Games, where interests are strictly opposite so that players either win all or lose everything; Battle-of-Sexes Games, where players have mixed interests and behaviour is ambiguous; and Coordination and Anti-coordination Games, where players have common interests for either getting together or stepping aside and their behaviour is ambiguous.

3. Course structure and schedule

Overall, this course has six sessions. The five classes of games are subjects of Session 2 to 6. In a first Session 1, Professor Jost introduces into the basics of game theory and strategic behaviour. Each session – except the introductory Session 1 – is divided into two parts:

1. First, in a two-hour block, Professor Jost presents the theoretical background and illustrates these insights with the help of numerous case studies, movies and applications.
2. Second, also in a two-hour block, we have two experiments which complement and further develop important aspects of the theoretical part. Each experiment is based on an experimental research paper and run by a group of two to three students.

Session 1 Theory of Games & Moves	Session 2 Prisoner's Dilemma Games	Session 3 Dis-coordination Games	Session 4 Zero-Sum Games	Session 5 Battle of Sexes Games	Session 6 Anti- & Coordination Games
Introductory Lecture	Theory	Theory	Theory	Theory	Theory
Theory	Experiment 1	Experiment 3	Experiment 5	Experiment 7	Experiment 9
	Experiment 2	Experiment 4	Experiment 6	Experiment 8	Experiment 10
Individual Assignment (at home)	Individual Assignment (at home)	Individual Assignment (at home)	Individual Assignment (at home)	Individual Assignment (at home)	

Before the course starts, you can choose the topic that interests you most. You and your group members will then be handed out a research paper that covers this topic. Based on the experiment explained in the paper, your group needs to design a simplified and creative version of the experiment that you can play with your fellow students in the classroom. You need to set-up the procedure of the experiment, determine experimental treatments, specify the participants' payoffs, and design all materials you need to run the experiment. I will upload a guideline that will help you in this process. After the first lecture and before the second lecture, I will discuss with every group the topic so that we can clarify any problems and discuss your ideas. After you have run the experiment, you should discuss the underlying paper and practical implications with your fellow students in a short presentation.

After each of the sessions, you have to prepare problem sets at home dealing with the discussed problems. The answers should be submitted before the beginning of the next session.

The time schedule and the locations for this course are as follows:

Session / Deadline	Lecture topic	Experiments	Date	Location
Deadline for choosing experiments			31.12.2024 (End of the day)	
Session 1	Theory of Games and Moves	/	15.01.2025 13:00-16:00	tba
Discussion of your experiment			15.-17.01.2025 individual	
Session 2	Prisoners' Dilemma Games	tbd	21.01.2025 13:00-16:00	tba
Session 3	Dis-coordination Games	tbd	21.01.2025 16:00-19:00	tba
Session 4	Zero-sum Games	tbd	22.01.2025 13:00-16:00	tba
Session 5	Battle-of-Sexes Games	tbd	22.01.2025 16:00-19:00	tba
Session 6	Coordination & Anti-coordination Games	tbd	23.01.2025 13:00-16:00	tba

4. Course material and literature

The lecture slides will be provided before the lecture starts. There is no basic textbook for this course, but the following books are complementing the course:

- Dixit, A. & B. Nalebuff, 1993. Thinking Strategically. Norton
- Gibbons, R., 1992, A Primer in Game Theory. Financial Times/Prentice Hall
- Harrington, J., 2008. Games, Strategies and Decision Making. Worth Publishers
- Jost, P.J & U. Weitzel: Strategic Conflict Management: A Game-Theoretical Introduction, 2007, Edward Elgar.
- Schelling, T. C., 1960. The Strategy of Conflict. Harvard University Press

5. Course grading

Students will be graded based on three different aspects: Students will be graded based on three different aspects:

1. Experiment: 35%

In groups of two to three students, you will work on a topic and develop an experiment. Please send your first three preferences for a topic to pjost@whu.edu. You will conduct the experiment with your fellow students in the classroom. Please note that it is highly important not to discuss the content of your experiment with other students! Some experiments might only work if participants do not know what is analysed. Your results might be biased if students anticipate how to act.

2. Presentation: 35%

After the experiment, your presentation should inform the class about the content of the experiment, the effects observed, the research paper, underlying concepts, and practical implications. Students are also invited to discuss their observations during the experiment and critically assess the underlying concepts.

3. Individual assignments: 30%

After each class, individual assignments will be uploaded. These assignments correspond to the solution concept of the respective session. You solve these assignments individually and submit your handwritten solutions at the beginning of the last session. Only your 4 best (out of 5) assignments will be graded.

4. Class participation: Tiebreaker

In case you are between grades, your oral grade is the tiebreaker. It depends on your attendance as well as on your contributions (not just quantity, but also the quality!) to the discussions in class.

6. Course prerequisites

Enrolling in this course requires (informal) prerequisites:

- Elementary mathematics, for example, solving equations or taking derivatives.
- Your willingness to solve puzzles!

7. Learning outcomes

By the end of the course, students will advance their knowledge in different ways:

- Learning the basic principles of game theory will help you improve your own strategic thinking and your understanding why and how people make decisions
- Learning to create value through team work will be useful for next group works and cases
- Learning to apply game theoretical basics will serve as foundation for advanced courses
- Learning to analyze and apply a theoretical paper will help you to relate theory to praxis
- Learning a scientific method will be helpful for your bachelor and master thesis
- Learning to speak in front of others will be useful for your university and business career