- Faculté des sciences économiques
- www.unine.ch/seco

Game Theory (5ER1020)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Bachelor en sciences économiques, orientation économie	**Cours: 4 ph**	**Voir ci-dessous**	6
Bachelor en sciences économiques, orientation management	**Cours: 4 ph**	**Voir ci-dessous**	6
Bachelor of Science en économie et sport	**Cours: 4 ph**	**Voir ci-dessous**	6
Pilier B A - économie	**Cours: 4 ph**	**Voir ci-dessous**	6

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Printemps

Equipe enseignante

Mehdi Farsi, Professor
Institute of Economic Research, Université de Neuchâtel
mehdi.farsi@unine.ch

Valentine Grutta, Assistant
Institute of Economic Research, Université de Neuchâtel
valentine.grutta@unine.ch

Contenu

This course offers a systematic way of analyzing strategic decision-making in interactive situations (games) arising in economics and business. It introduces the conceptual frame-work and analytical tools for solving these games. The main objective is to develop and enhance the student's ability to think strategically in complex situations. The students will learn various aspects of strategic interactions through multiple examples and applications. They will also see many strategic situations where game theory can be applied and will learn how the theory can help resolve these situations.

Focusing on non-cooperative game theory, the course applies standard techniques such as domination of strategies, Nash Equilibrium and backward induction across a wide variety of static and dynamic games. The course includes common applications of game theory such as cooperation and bargaining.

The covered topics include:
- Strategic reasoning
- Games with sequential moves
- Games with discrete and continuous strategies
- Games with mixed strategies
- Information games and uncertainty
- Repeated games
- Collective-action games
- Contracts and cooperation
- Evolutionary games
- Negotiations and bargaining

Forme de l'évaluation

Final grade is based on a 2-hour written closed-book exam during the exam session at the end of the semester.

With the exception of a simple calculator no documents or connected objects are allowed during the exam. Any violation of these rules will be considered as fraud, leading to the withdrawal of unauthorized items and possibly exam failure.

Assignments are rewarded by a bonus added to the final grade. More details are given in class.

Modalités de rattrapage

Based on a retake exam organized during the exam session. This is also a 2-hour written closed-book exam.

With the exception of a simple calculator no documents or connected objects are allowed during the exam. Any violation of these rules will be

- Faculté des sciences économiques
- www.unine.ch/seco

Game Theory (5ER1020)

considered as fraud, leading to the withdrawal of unauthorized items and possibly exam failure.

No assignment bonus is considered for the retake exam. For justified absences in the final exam (in June), the student can request that their bonus be transferred to the following exam session (in August). The request needs to be done at the latest, within 2 weeks after the date of the first exam. All bonuses will expire after the following exam session (August 2024).

Documentation

Main textbooks:
- Games of Strategy, 5th ed., Dixit, A., Skeath. S. & McAdams, D. 2020.
- Games, Strategies and Decision Making, 2nd ed., Harrington Jr., J. E. 2014.
Other references:
- Strategy: An Introduction to Game Theory, 3rd ed., Watson, J., 2013.
- Games of Strategy, 3rd ed., Dixit, A., Skeath. S. & Reiley, D.H. 2010.
- Game Theory: An Applied Introduction, Ferreira, J. L., 2020.

Pré-requis

Basic Microeconomics (Introduction à l'économie 1)

Forme de l'enseignement

Lectures: 4 hours per week
Office hours: upon request by e-mail

Objectifs d'apprentissage

Au terme de la formation l'étudiant-e doit être capable de :

- Identify different types of games and their uses in strategic thinking
- Formulate real-world contexts using game theory concepts
- Predict outcomes of various strategic interactions
- Apply models of bargaining and negotiation
- Justify game theory in an evolutionary perspective
- Recognise strands of game theory and its main concepts
- Analyse different games and use a variety of tools to find equilibria
- Judge the importance of information in games

Compétences transférables

- Assimilate logical reasoning
- Develop mathematical rigor
- Solve quantitative problems
- Conceptualise decision contexts and its determinants