Summer Course Proposal

Total Hours: 40 Hours, 4H/day, from 9:00 to 13:00, during 2 weeks (16 to 27 of July)

ECTS: 4

Course Name: Game Theory and Applications in Economics

Course Description:

The course introduces the main concepts and tools of game theory with the aim to enable you to read original game-theoretic literature and to prepare you to do research in the field. You will learn how to represent an economic situation as a game (part 1) and how to analyze it using different equilibrium concepts proposed in the literature, the prominent one being the Nash equilibrium (parts 2 and 3).

Main Goals:

Upon completion of this course, the student should be able to:

- To understand the notion of strategic behaviour;
- To learn and to distinguish the different types of equilibrium;
- Determine the equilibrium solution in static and dynamic games;
- To apply the Game Theory to the theoretical models.

Syllabus:

1. Basics of Game Theory
- Historical Note on Game Theory
- Elements of Game Theory: basic definitions and concepts
- Actions, Strategies, and return balance;
- Pure strategies

2. Static games with complete information
-Static games and Nash equilibrium
- Applications
- Mixed strategies

3. Dynamic games of complete information and subgame perfect equilibrium

- Dynamic games of complete information: representation and subgame perfect equilibrium
- The model of Stackelberg duopoly

Responsible Teacher (ESHT): Fernanda Amélia Fernandes Ferreira

International Invited Teacher: Rozalia Veronica Rus/ Oana Ruxandra Bode

Required course materials: Room with projector

Assessment:

Homework assignments will be distributed during the term. Students will conduct one element of evaluation: 1 Essay.

Main References:

- Dutta, Prajit K. (1999), Strategies and Games – Theory and Practice, MIT Press.
- Gibbons, R. (1992), A Primer in Game Theory, Prentice Hall.

Short Bio of responsible teacher (maximum of 200 words):

Fernanda A. Ferreira is Adjunct Professor in the Department of Informatics and Mathematics at the School of Hospitality and Tourism of Polytechnic Institute of Porto, Portugal. She holds a BS in Mathematics and a PhD in Applied Mathematics from the University of Porto. She obtained also a Diploma of Advanced Studies in Statistics and Operations Research from Vigo University. A member and Coordinator of the Applied Management Research Unit (UNIAG), her publications, mostly journal and conference papers, cover the research interest areas of industrial organization, game theory and tourism (ORCID ID: orcid.org/0000-0002-1335-7821). Co-author of two books published in the Mathematics area. Supervised dissertations in the areas of Hospitality, Game Theory and Management. She also organizes Symposium on "Operational Research and Applications" in several International Conferences and has collaborated as reviewer with several journals.

Short Bio of other teachers (if applicable – maximum of 200 words):

Rozalia Veronica Rus has been working at the Faculty of Business, Babeș-Bolyai University of Cluj-Napoca, Romania since 2003. In 2009, she received her PhD degree in Cybernetics and Statistics for Economy from Babeş-Bolyai University, Cluj-Napoca, Romania. Since 2014, she is Associate Professor at the Hospitality Services Department, Faculty of Business, Babeş-Bolyai University and she is teaching courses on Database, Hospitality Information Systems, Tourism Information Systems and Decision Support Systems for Hospitality. She participated in several international and national projects. Her research is focused on Business Intelligence, Hospitality Information Systems and E-Tourism.

Oana Ruxandra Bode has been working at the Faculty of Business, Babeș-Bolyai University of Cluj-Napoca, Romania since 2011. In 2012, she received her PhD degree in Mathematics from Babeş-Bolyai University, Cluj-Napoca, Romania. Since 2016, she is a Teaching Assistent at the Hospitality Services Department, Faculty of Business, Babeş-Bolyai University and she is teaching seminars on Microeconomics and Macroeconomics. She participated in several international and national projects. Her research is focused on Mathematics Applied in Economics, Industrial Organization and Tourism.