Game Theory: Basic Concepts and Applications

Course manual

1   Introduction

This course is an introduction to some basic concepts of Game Theory. The aim of the course is twofold, viz., on the one hand, to provide a brief overview of the standard analytical tools that are used for modeling strategic interaction and predicting its outcome, and on the other hand to introduce the main methodological tools used to test these predictions.

   The course is structured in a way such that a student can be successful by attending all scheduled (online) meetings, and studying according to the schedule described below. In order to pass the course, the students will need to complete certain tasks (participation, problem sets, papers, presentations). These tasks will be submitted in groups that will be formed at the beginning of the first lecture. There will be four working groups per tutorial group.

2   Course structure

The course consists of two lectures and four tutorial meetings. The topics to be covered are solution concepts for static games (first week; Elias Tsakas) and solution concepts for dynamic games (second week; Dries Vermeulen). The structure of each of the two weeks is as follows:

1. **Lecture** (Monday). Before the lecture the students will be provides with a set of slides, that present the concepts of the lecture. Students are expected to carefully go through them, and make sure they understand the main points. During the lecture the instructor will invite students to ask questions, and will then elaborate on these questions. At the end of the lecture the students will be handed a problem set. Moreover, paper topics will be assigned to two of the four groups (the ones responsible for presenting that week).

2. **Exercise session** (Wednesday). The students are expected to have typewritten their solutions of the problem set before the exercise session and have sent them to the tutor. During the online meeting, the tutor will present the correct solutions to the students.

3. **Paper session** (Friday). The students that belong to one of the two groups that have been assigned a topic, are expected to write a (maximum 3-page) paper on the topic. The papers must be sent by email to the tutor, latest on Sunday of the same week (two days after the paper session). Presentations will have to be divided in parts so that each student is responsible for separate parts, in order to facilitate online presentations. More information on th e logistics of the presentations will be provided during the first lecture.

   The topics of the four presentations (two per week) are the following:

   (a) Traveller's dilemma (Main reference: Goeree and Holt, 2001; Section I.A)

   (b) Matching pennies (Main reference: Goeree and Holt, 2001; Section I.B)

   (c) Trust in others' rationality/Belief in non-credible threat (Main reference: Goeree and Holt, 2001; Sections II.A-II.B)

   (d) Two-stage bargaining (Main reference: Goeree and Holt, 2001; Section II.C)

Each of the previous topics focuses on experimentally testing one game-theoretic solution concept, among the ones that have been discussed in the preceding lecture. The paper and the presentation should be structured as follows: the students should briefly (i) present the underlying game, (ii) describe – when relevant – the behavioral phenomenon that we model with this game, (iii) solve the game using the solution concept that is applied in the main reference in order to obtain the theoretical predictions, (iv) present the experimental results from the main reference, and relate them with the

theoretical predictions, (v) present a moderate literature review (not more than two paragraphs) on other experimental and/or theoretical work on this game.

2.1   Content

The research article needed for the course:

GOEREE, J. & HOLT, C. (2001). Ten little treasures of game theory and ten intuitive contradictions. *American Economic Review* 91, 1402–1422.

Additional material will be provided by the course coordinator in the first meeting.

The topics that will be covered during the meetings of the respective week are the ones below.

1. **Static games** (Iterated elimination of dominated strategies; Nash equilibrium)

2. **Dynamic games** (Nash equilibrium; Subgame perfect equilibrium)

2.2   Performance assessment

Each student will receive a pass/fail grade. In order to pass the course, a student must fulfil all the following requirements (no substitutions allowed):

- **Participation:** The student needs to be present in at least 3 tutorial meetings. In case you miss one tutorial, this cannot be the one when you have to present.

- **Paper:** The paper must receive a pass grade.

- **Presentation:** The presentation must receive a pass grade.

3   Contact information

For any further information regarding the course, please contact:

- Elias Tsakas (first week; e.tsakas@maastrichtuniversity.nl)

- Dries Vermeulen (second week; d.vermeulen@maastrichtuniversity.nl)