GV4C8: Game Theory For Political Science 2014-15

Lecturer: Torun Dewan (CON 6.07)
Meeting Time: Monday 4-6 NAB 1.07
Office Hours: Thursday 2-3

1. Course Description

Game theory provides a scientific approach to the study of social interactions which focusses on the strategic aspects of decision-making between two or more individuals or groups. This course will cover the basic elements of game theory and how they have been applied in the area of political science. The aim of the course is to provide a deeper understanding of game-theoretic tools, to help you understand how these ideas have been developed and applied in the political science literature, and to prepare you for research in the area of formal theory.

The course is structured around a weekly lecture and a weekly class. The lectures will focus on the key technical issues and applications. The first part of the course will look at games in normal and in extensive form. The second part of the course course will focus on games which take place over time and games where informational uncertainty play a role.

The classes will be used for going over the problem sets assigned each week.

Assessment is on a two-hour exam in the summer term. You must also be asked to complete two pieces of unassessed work: a problem set that will be distributed in week 5 and handed in in week 6; and a mock exam that you will take place in week 9. These will be used to provide feedback on your progress.

1.1. **Readings.** Our core text is Osborne (2004) which covers all of the material and is particularly useful as it includes many political science applications. The problem sets will include exercises based on these political examples. Working through them will help you to understand not only the core material, but also some of the key issues in political science. Other books you may find useful are Gibbons (1992) which is at the same level as the course though focuses mainly on economic applications. You may find Fudenberg and Tirole

(1991) useful for some of the later topics, especially repeated games. Morrow (1994) is aimed specifically at political scientists and covers most of the topics.

1.2. **Problem Sets.** Each week you will be given some problems to solve from Osborne (2004). You should attempt these to ensure that you have a good grasp of the basic material. The solutions can be found on line at http://www.economics.utoronto.ca/osborne/igt/index.html. In addition you will be given a take home problem set.

References

Fudenberg, D., and J. Tirole (1991): *Game Theory*. Cambridge,Mass,MIT Press.

Gibbons, R. (1992): *A Primer in Game Theory*. Prentice Hall.

Morrow, J. (1994): *Game Theory for Political Scientists*. Princeton University Press.

Osborne, M. (2004): *An Introduction to Game Theory*. Oxford University Press.

2. topics

Week 2	Lecture	Static Games with Dominated Strategies
Week 3	Lecture	Nash Equilibrium
Week 4	Lecture	Extensive-form Games
Week 5	Lecture	Repeated Games
Week 6	Lecture	Bayes Nash Equilibrium
Week 7	Lecture	Perfect Bayesian Equilibrium
Week 8	Lecture	Applications
Week 9	No Lecture	Mock Exam
Week 10	No Lecture	Feedback and QA
Weeks 11 and 12	Summer Term	Revision and Exam Prep

3. Weekly topics

Week 1: Introduction

Week 2: Strategic Games with Dominated Strategies Osborne chapters 1-2,12 Problems 27.2, 33.1, 34.2, Problems on pages 73-76.

Week 3: Mixed Strategies

Osborne chapter 2-4

Problems 114.2, 118.3, 118.2, and 75.3

Further problems 74.1, 74.2, 75.1 75.2 on pages 74-76

Week 4: Extensive Form Games with Perfect Information

Osborne chapters 5-7

Problems 164.2 168.1 173.2 173.3 183.1 183.2

Further problems 187.1, 210.2, 217.1

Week 5: Repeated Games

Osborne chapter 14 and 15

Problems 426.1 429.1

Week 6: Bayes Rule and Bayesian Games, Bayesian Nash Equilibrium

Osborne chapter 9

Problems 276.1 277.1 290.1

Further problems 307.1

Week 7: Extensive games with imperfect information

Osborne chapter 10

Problems 316.1 331.1 331.2

Further problems 340.1

Week 8: Applications

Week 9: Mock Exam

Week 10: Feedback and Q and A