

Game Theory - 4 ECTS

7-18 May 2007

Bifröst University

Instructor: Ian Watson, Ph.D.

SYLLABUS

Meeting times: Lectures daily from 8:00-9:30. Section meetings: 9.35-10.15 (group A), 10.20-11.00 (group B), 11:05-11:45 (group C). Lectures and section meetings are in Aðalból. We *will* meet on May 17th.

Written work: Six short problem sets will each be worth 10% of your grade. They must be turned in *on paper* (NOT through Námskjár) the day following their assignment. They will be returned the next day. These assignments will be grudgingly accepted a day late (but no later) and if so will be marked down by 2 points on a 10-point scale.

One longer written assignment will be worth 30% of your grade and is due on Friday, May 18. It may be done jointly with a partner, in which case you must also do a five-minute class presentation on Thursday, May 17; if you choose this option, you must let me know by class time on Monday, May 14.

There is no exam in this class.

Discussion topics: Groups of students will lead discussion in four section meetings. Participation in these groups, plus attendance at our class session and student presentations on Thursday, May 17th, will be worth 10% of your grade.

Textbook: Avinash K. Dixit and Barry J. Nalebuff, *Thinking strategically* (W.W. Norton, 1993). ISBN 0393310353. The book may be purchased from the library, and is also available there on short-term loan.

A few supplementary reading materials will be posted on Námskjár, as will lecture slides and homework assignments.

Language: Lectures will be in English. Written work may be turned in either in Icelandic or English.

Monday, May 7 – Introduction

Introduction to the course and the subject of game theory.

Read for today: Dixit & Nalebuff, pp. 1-30.

Tuesday, May 8 – Sequential Games

Games which are played over the course of time, where one player's move precedes the next.

Read for today: Dixit & Nalebuff, pp. 31-55.

Problem Set 1 passed out.

Wednesday, May 9 – Simultaneous Games

Games where the players move simultaneously, without seeing what the other chooses.

Read for today: Dixit & Nalebuff, pp. 56-86.

Problem Set 2 passed out.

Thursday, May 10 – The Prisoner's Dilemma

The abstract form and social consequences of prisoner's-dilemma type games.

Read for today: Dixit & Nalebuff, pp. 11-14 (again), pp. 89-118, and pp. 347-349.

Problem Set 3 passed out.

Discussion topic in section: Voting (D&N, chapter 10).

Friday, May 11 – Advanced Topics I

Strategic moves, perfect versus imperfect information, collusion and side payments.

Read for today: Dixit & Nalebuff, pp. 119-167.

Section meetings combined to watch *A Brilliant Madness* (documentary about John Nash).

Monday, May 14 – Advanced Topics II

Mixed strategies, one-shot versus repeated games, game theory and everyday life.

Read for today: Dixit & Nalebuff, pp. 168-201.

Problem Set 4 passed out.

Let me know by today if you plan to do a presentation for your paper.

Discussion topic in section: Negotiating with hostage takers.

Tuesday, May 15 – Convention and Coordination I

Modeling conventions with game theory. Game theory and norms. Convention in everyday life.

Read for today: Dixit & Nalebuff, pp. 223-225 and 231-240.

Thomas Schelling, *The strategy of conflict* (Harvard University Press, 1960), pp. 54-58 ("Tacit coordination"). On Námskjár.

David Lewis, *Convention* (Harvard University Press, 1969), pp. 1-51. On Námskjár.

Peter Kincaid, *The rule of the road* (Greenwood Press, 1986), pp. 116-120 (the section about Iceland). On Námskjár.

Problem Set 5 passed out on Tuesday.

Discussion topic in section: Worker safety standards.

Wednesday, May 16 – Convention and Coordination II

Today we will welcome a guest lecturer, Pelle Guldborg Hansen from Roskilde University in Denmark (<http://akira.ruc.dk/~pgh/>). He has studied and written extensively about convention.

Discussion topic in section: QWERTY and path dependence.

Thursday, May 17 – Social Modeling

The mathematical modeling of society, from neighborhood segregation and the Game of Life to traffic analysis and "econophysics."

Read for today:

Dixit & Nalebuff, pp. 241-245.

Thomas Schelling, *Micromotives and macrobehavior* (W.W. Norton, 1978), pp. 83-133 ("Thermostats, lemons, and other families of models.") Posted in PDF form on Námskjár. Note that you do *not* have to understand the graphs on pages 102-110 in detail; you may skim these pages.

Philip Ball, "The physical modelling of human social systems," *ComplexUs* 1 (November 2004). Available on Námskjár or at www.agrfoto.com/philipball/docs/pdf/Complexus_article.pdf

Class presentations during section meeting for those who chose to do their papers in pairs; presentations should be e-mailed to me the night before (ian@bifrost.is). Attendance will be part of your grade.

No assignment tonight except reading for tomorrow.

Friday, May 18 – Arms Control and Nuclear Deterrence

Game theory and the Cold War: the arms race, nuclear deterrence, and mutually assured destruction.

Read for today: Dixit & Nalebuff, pp. 205-222.

Problem Set 6 completed in-class.

Papers due today.