Game Theory
Essex Summer School
Session One, 11—22 July 2016

Instructor: Dr. Philip Arena

Email: parena@essex.ac.uk

Website: filarena.weebly.com

Teaching Assistant: Julian Schuessler

Email: jschue@essex.ac.uk

Course Content

This course will cover basic through intermediate game theory as well as the relationship between formal theory and empirical research.

Course Objectives

Students should leave the course with a solid foundation in applied game theory. With supervision, they will be able to incorporate game-theoretic models in their own research. They will also become more informed consumers of formal theory and be better positioned to carry out empirical work that speaks to broader theoretical debates in their areas of substantive interest.

Course Prerequisites

A solid foundation in basic mathematics (particularly algebra) will be helpful, as would some familiarity with calculus. However, there are no other prerequisites. A few sessions will be set aside to cover important mathematical foundations, including algebra and calculus.

Suggested texts

Kevin Clarke and David Primo. 2012. *A Model Discipline.*

Will Moore and David Siegel. 2013. *A Mathematics Course for Political and Social Research.*

Nolan McCarty and Adam Meirowitz. 2007. *Political Game Theory.*

Course Schedule

Monday 1: Models

Criticisms of the conventional view of science
The power and necessity of simplification
Theoretical versus empirical models and when (not) to combine them

Tuesday 1: Rationality

Common critiques of "rational choice"
The Allais Paradox
Homo Economicus and other stylized views
Evidence from experiments

Wednesday 1: Mathematical Foundations I

Review of basic algebra
A primer on formal logic
Notational conventions
Calculus
First problem set distributed

Thursday 1: Mathematical Foundations II

Calculus, continued
Application to public good provision

Friday 1: Simple Games

Iterated elimination of dominated strategies
Backwards induction
Mixed strategies
Cut-point strategies
Application to campaign platforms
First problem set due, second distributed

Monday 2: Repeated Games

Finite games
Infinitely repeated games
Application to inter-ethnic cooperation

Tuesday 2: Incomplete Information I

Application to trade
Application to teenage angst

Wednesday 2: Incomplete Information II

Signaling games
Application to education
Second problem set due, third distributed

Thursday 2: Bargaining

Nash bargaining solution
Rubenstein's model
Application to crisis bargaining

Friday 2: Empirical Evaluation

Models as the complete data-generating process
Experiments
Statistical backwards induction
Quantal response equilibria
Third problem set due