GAME THEORY I
UNIVERSITY OF VIRGINIA
TUESDAYS 2–4:30 PM, BRYAN HALL 332
SPRING 2018

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COURSE DESCRIPTION

This course is an introduction to graduate level game theory. The goal of the course is to expose students to basic concepts in game theory as well as how to solve commonly used models in political science. The goal of this class is to prepare students to be "consumers" of game theoretic work in political science. We will not focus on writing your own formal models in this class. We will not use very advanced math in this class – I will assume a working knowledge of algebra.

COURSE REQUIREMENTS
1. Problem Sets – 15%
Problem sets will be assigned every two weeks and solutions will be provided after problem sets are due. Problem sets are due in class on the dates marked.

2. Midterm – 35%
We will have an in-class midterm on **Tuesday, March 27**.

3. Final – 50%
We will have a final on **Tuesday, May 8 from 2:00-4:30 PM**.

Both exams will be open note/ open book.

SOME GUIDANCE

Math can feel hard for everyone sometimes. **Do not be afraid or embarrassed to ask for help – either from me or from your classmates.** Take advantage of office hours and please feel free to ask questions at any time in class. If anyone does not understand something, I am more than happy to stop and clarify the point before we move on. It is not a good idea to "skip" things in math – if you don't understand something now, don't wait. Clarify immediately. A lot of things build on top of each other, and a small question now will likely turn into much more confusion later. **This also means that you should stay on top of the problem sets.**

PROBLEM SETS AND COLLABORATION

Collaboration is always a good idea in methods classes – you can learn as much from your classmates as you do from me! You are more than welcome to work with each other on your problem sets and study in groups. **Each person should turn in their own problem set.**

Here is my recommendation for the best way to approach problem sets: First try the problems on your own. Then come together as a group to talk through any questions. You can also come talk to me during office hours. Finish up the problem set on your own.

You will not learn anything by simply copying someone else's problem set. I would rather you not turn anything in than copy someone else's problem sets – it wastes everyone's time, including the grader's. Note that problem sets are worth VERY LITTLE. I would rather you turn in a problem set that you worked through on your own with a lot of mistakes because it is better than you engaged with the material.

We will supply solutions to the problems after the problem sets are due. Late problem sets will not be graded.

TEXTBOOKS

There isn't a single game theory textbook that will work perfectly for everyone. I will use *An Introduction to Game Theory* by Martin Osborne as my primary reference textbook. However, I recommend that you also take a look at some of the different textbook options listed below and figure out which book works best for you!

Game Theory: An Introduction by Steven Tadelis is another good option. It's a little more technical than the Osborne book but is still very clearly written.

Political Game Theory by Nolan McCarty and Adam Meirowitz can also be very useful, since it is written by two political scientists, for a political science audience in mind.

A Course in Game Theory by Martin Osborne and Ariel Rubinstein is a much more technical text, so this is a great option if you're looking for something more advanced. It's also free online!

SCHEDULE

Below is a tentative schedule for the semester. The dates for the midterm and final are set, but the topics covered during each week may be adjusted slightly as we go along.

Jan 23 – Introduction to game theory and rational choice
Osborne: Chapter 1

STATIC GAMES OF COMPLETE INFORMATION

Jan 30 – Nash Equilibrium and Normal Form Games (Part 1)
Osborne: Chapter 2-3
Problem Set 1 due

Feb 6 –Normal Form Games (Part 2)
Osborne: Chapter 2-3

Feb 13 – Mixed Strategies
Osborne: Chapter 4
Problem Set 2 due

DYNAMIC GAMES OF COMPLETE INFORMATION

Feb 20 – Extensive Form Games (Part 1)
Osborne: Chapters 5-7

Feb 27 – Extensive Form Games (Part 2)
Osborne: Chapters 5-7
Problem Set 3 due

March 6 – ***NO CLASS – SPRING BREAK***

March 13 – ***CLASS CANCELLED***

March 20 – Repeated Games
Osborne: Chapters 14-15

March 27 – ***MIDTERM EXAM***

April 3 – Bargaining Models
Osborne: Chapter 16

STATIC GAMES OF INCOMPLETE INFORMATION

April 10 – Bayesian Games
Osborne: Chapter 9
Problem Set 4 due

DYNAMIC GAMES OF INCOMPLETE INFORMATION

April 17 – Extensive Form Games with Incomplete Information
Osborne: Chapter 10.1-10.4

April 24 – Signaling Games and Perfect Bayesian Equilibrium
Osborne: Chapter 10.5-10.9
Problem Set 5 due

May 1 – Overflow and Review

FINAL EXAM – TUESDAY, MAY 8, 2:00-4:30 PM