

# Introduction

## PhD Industrial Organization

Nicholas Vreugdenhil

# Plan for today

1. What is industrial organization?
2. Discuss syllabus
3. Introduce yourself

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# What is industrial organization (IO)?

- **IO is the study of firm and consumer behavior in markets between (and including) the polar opposites of perfect competition and monopoly.**
- Why is this useful? Some examples...
  1. Designing regulation and thinking about counterfactual policies:
    - Hinges on the details of how firms and consumer behave. E.g. merger policy
  2. Firm strategy
    - e.g. How to set prices? How to design online marketplaces?
  3. Getting a job (?)
    - Estimating a model in your research can be a good way to differentiate yourself from other candidates
    - Candidates with IO skills are in short supply and high demand in both academia and industry.
    - Emphasis: models in this course are a complement - not a substitute - to detailed micro-data and other approaches (like the causal inference toolbox)

## What are the aims of this course?

- **Main aim:** Get you up to speed with the core **methods** from 'New' Empirical IO
  - This toolbox started to be developed in the late '80s. Development continues up to the present day.
  - Limitation of the course: will not go into great depth about 'traditional' IO applications of these methods
- **Second aim:** get you started on research and get you to understand where the frontier of knowledge lies.

# History of IO

- **History:** in the 1980s IO was dominated by game theoretic methods to think about competition, oligopoly, firm decision making.
  - A key reason for developing the empirical methods discussed in this course is applying these theories to data, testing them, and using the models to do, for example, policy evaluation
- **Recent developments:** applying these methods outside 'traditional' IO topics
  - 'Traditional' IO topics: mergers, competition policy
  - Recent applications: health, education, energy, environmental, trade, urban economics, market design,...

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# Main topics in this course

1. Demand estimation
2. Single agent dynamics
3. Dynamic games/oligopoly
4. Production function estimation and productivity
5. Auctions (if time permits)
6. Paper presentations (focusing on recent influential IO papers across many subfields including Education, Healthcare, Environmental, etc...)

## Textbook and readings

- There is no textbook for this course. But, the lectures will focus on the first four chapters of the new volume of the *Handbook of Industrial Organization (Volume 4)*
- Key papers I will discuss are on the reading list in the syllabus (and the most important have a \*)
- I encourage you to read the papers (particularly those with a \*), and I expect you to read the papers for the student paper presentations before the lecture.

## Assessment and grading

- Second year PhD course, so the priority is research and noone will ever look at your grades...
- ...but this is how your final grade will be determined:
  - 50% Two homework assignments
  - 40% Half-hour paper presentations
  - 10% Engagement in class discussion

## ASU Sync

- Link is on the syllabus
- Email me if you intend to use it so I can make sure that ASU Sync is connected

## Preliminaries/preparation (do these early in the semester)

- Computational resources: apply for access to the ASU Agave computer system and familiarize yourself in how to use it (you could do this by attending a regularly scheduled tutorial by the ASU computing people).
- Version control: learn how to use Git, and sign up for Github.
- Programming language: settle on a programming language to use in your work.
  - Important: I have put a .pdf on canvas about 'best practices' in programming that includes advice on unit testing, profiling, structuring your code

# Background

- Theory You are well prepared for this course from your first year PhD coursework.
- For this course, I expect that you have some understanding of IO at the level of an undergraduate IO course.
  - e.g. Cabral “Introduction to Industrial Organization”
- Empirics We will pick up where Alvin Murphy’s Econometrics II course left off (review lecture 11 about discrete choice models)
  - e.g. Train “Discrete Choice Methods with Simulation” is another good book to review

## Other things to consider

- Applied micro hiring this year: come to job talks
- Attend applied micro seminar
- Start thinking about your third-year paper.
  - Important: as well as thinking about general topics and questions, focus on obtaining detailed micro-data.

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