DUKE
FUQUA
SCHOOL OF BUSINESS

# Empirical Analysis for Strategy

Winter 2021 Syllabus


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## COURSE OVERVIEW

This course introduces statistical techniques to evaluate firm strategies, focusing primarily on causal inference. Using observational data to establish causality — the conclusion that one thing causes another — has important applications in economics, business and policy, as it allows us to measure and predict the true effectiveness of our decisions.

## TEACHING APPROACH

To convey the two principal aspects of the course, technical skills and economic intuition, we will first present a series of abstract statistical models and then demonstrate their practical applications through case discussions and in-class exercises.

## MATHEMATICS + STATISTICS

This course requires some familiarity with basic algebra and calculus, including systems of equations and derivatives. For statistics, you will need a background in regression and probability, as well as software such as R or Stata.

## ASSESSMENT

Your final course grade will be based on the following three components:

I. Class Participation – 20%
II. Online Assignments – 40%
III. Final Exam – 40%

Class Participation Effective participation in class discussions requires a thorough familiarity with the readings. Ideally, the following criteria should guide your contributions:

- Relevant – Are your comments related to the case and to the comments of others?
- Conceptual – Are you applying economic concepts and frameworks appropriately?
- Original – Do your comments introduce fresh perspectives into the discussion?
- Substantive – Have you used specific facts to support your claims?
- Logical – Is your reasoning consistent and coherent?

Your participation grade for each class will follow a scale from 0 to 5, roughly in line with:

- 0 for those who are absent
- 1 for those who attend class but do not participate
- 2-5 for those who participate, depending on the quality of the comments.

Please note that I do not necessarily expect every student to participate in every class, and your final participation score will reflect a weighted average of your best classes.

Online Assignments In each live session, we will discuss academic studies related to that day's topic. Each has an associated online assignment, and you will choose four of the six sessions to submit answers totaling about 2-3 pages of analysis (at most 2-3 paragraphs per question, with some requiring only a sentence or two) in which you assess the study's credibility and usefulness. These are due immediately before each class.

**Final Exam** The final exam will cover all six topics from the course and will require you to evaluate a series of case studies.

## COURSE MATERIALS

All relevant course materials are posted on Canvas. In addition, we will cover the textbook extensively in the class recordings and sessions.

**Course Textbook** Angrist & Pischke, *Mastering 'Metrics: The Path from Cause to Effect*

**Discussion Questions** I will provide a series of preparation questions to guide your reading before class and facilitate your participation in case discussions.

**Readings** Links to the articles for each case discussion are posted on Canvas.

**Supplemental Articles** I will post articles related to our course topics throughout the term on Twitter @ryanmcdevitt. I do this solely to highlight how our course relates to current issues in the press; you should not consider these articles "required reading."

## HONOR CODE

The Fuqua School of Business Honor Code applies to all aspects of this course. The nature of each assignment indicates the type of communication and consultation that is permitted. Work that is described as an individual effort is to be your work alone, without consultation or assistance from any other person. Work that is described as a team effort is to be your team's effort alone, again without consultation or assistance from anyone else. If you are uncertain about the nature of any assignment, please ask the instructor in advance.

## OFFICE HOURS + COMMUNICATION

You may email me about anything at any time (I usually respond quickly). For additional help, you may also contact the teaching assistants for the course, Riley League (riley.league@duke.edu) and Kelly Yang (kelly.kaili.yang@duke.edu).

## SCHEDULE

### CLASS 1: EXPERIMENTAL DESIGN

Before Class
- Complete Article Review Questions
- Read "How Much Alcohol…" NYT article
- Read "Three or More Eggs…" CNN article
- Read "It's Time as Academics…" Forbes article
- Read "The Evidence Supports…" WSJ article
- Read "AI Can't Reason Why" WSJ article
- Listen "Does Advertising…" Freakonmics podcast
- Read Chapter 1 in Mastering 'Metrics
- Watch Class 1 Videos

During Class
- Course Introduction
- Are Eggs, Alcohol, & NutraSweet Bad for You? Case Discussion
- Experimental Design + Causal Inference Lecture
- Does Advertising Actually Work?

After Class
- Read Lecture Summary

### CLASS 2: REGRESSION REVIEW + FIXED EFFECTS

Before Class
- Complete Article Review Questions
- Read "Nike Says…" NYT article
- Read "Nike Vaporfly…" NYT article
- Read "The Costs of Low Birth Weight" QJE article
- Read Chapter 2 in Mastering 'Metrics
- Watch Class 2 Videos

During Class
- OLS Regression Lecture
- Nike Vaporfly 4% Case Discussion
- Fixed Effects Regression Lecture
- Low Birth Weight Case Discussion

After Class
- Read Lecture Summary

### CLASS 3: MATCHING MODELS + ESTIMATION

Before Class
- Complete Article Review Questions
- Read "Propensity Scores…" SMMR article
- Read "A Comparison of Approaches…" Mkt Sci article
- Watch Class 3 Videos

During Class
- Breastfeeding Benefits Case Discussion
- Matching Models Lecture
- Field Experiments at Facebook Case Discussion
- Workplace Smoking Ban Code Example

After Class
- Read Lecture Summary

## CLASS 4: INSTRUMENTAL VARIABLES

Before Class
- Complete Article Review Questions
- Read "Consumer Protection…" NBER article
- Read "Bias in Cable News…" MI article
- Read "Is There a Doctor…" SIEPER article
- Read Chapter 3 in Mastering 'Metrics
- Watch Class 4 Videos

During Class
- Is There a Doctor in the House? Case Discussion
- Instrumental Variables Lecture
- Consumer Protection Case Discussion
- Bias in Cable News Case Discussion

After Class
- Read Lecture Summary

## CLASS 5: REGRESSION DISCONTINUITY DESIGN

Before Class
- Complete Article Review Questions
- Read "Reviews, Reputation, and Revenue…" HBS article
- Read "Using Big Data…" NBER article
- Read "Does Medicare Save Lives?" QJE article
- Read Chapter 4 in Mastering 'Metrics
- Watch Class 5 Videos

During Class
- Yelp Case Discussion
- Regression Discontinuity Design Lecture
- Uber Case Discussion
- Does Medicare Save Lives? Case Discussion

After Class
- Read Lecture Summary

## CLASS 6: DIFFERENCES-IN-DIFFERENCES ESTIMATION

Before Class
- Complete Article Review Questions
- Read "How Acquisitions Affect…" QJE article
- Read "America's Healthcare System…" LA Times article
- Watch John Oliver Dialysis Segment
- Read "The Effect of Social Interaction…" Mgt Sci article
- Read Chapter 5 in Mastering 'Metrics
- Watch Class 6 Videos

During Class
- Dialysis Mergers Case Discussion
- Differences-in-Differences Lecture
- Pizza & Beer Case Discussion

After Class
- Read Lecture Summary

## FINAL EXAM

Case Analyses
- "Strategic Patient Discharge…" AER article
- "Hospital Discharges…" WSJ article
- "The Effect of Bundled Payments…" working paper
- "Association of Daily Step Count…" JAMA article