

**INTE-GE 2008: INTRODUCTION TO QUANTITATIVE ANALYSIS
NEW YORK UNIVERSITY**

Spring 2018

Professor:	Hua-Yu Sebastian Cherng, PhD 246 Greene Street, Room 309 Email: cherng@nyu.edu
Office hours:	Thursdays, 3:45 – 4:45 p.m. (in my office)
Lecture:	Thursdays, 4:55 – 6:55 p.m. (GCASL 288)
Teaching assistant:	Emily Dunlop Email: emily.dunlop@nyu.edu
Recitations:	Section 002: Th. 7:00 – 8:00 p.m. (12 WV L111) Section 003: Th. 8:05 p.m. – 9:05 p.m. (12 WV L111)

**COURSE
DESCRIPTION**

This course serves as an introduction to the analytic and empirical methodologies employed in contemporary quantitative analyses of international, comparative, and US education. Across various sub-fields and topics covered in this class, this course will emphasize thoughtful consumption of literature that uses quantitative methods, a basic understanding of the statistics and theory behind different methods, and application of common statistical techniques.

**COURSE
OBJECTIVES**

Upon completion of this course, students will be able to:

- Read, interpret, and synthesize the findings of simple quantitative research in education.
- Critique quantitative research in education by identifying the challenges associated with casual inference based on different quantitative techniques.
- Present quantitative research, both orally and in written forms.
- Produce basic descriptive statistics for consumption by readers who may not be familiar with statistics.

READINGS

There are no required textbooks for this course that need to be purchased. Assigned readings will consist of book chapters or journal articles from a variety of sources (a reading list is attached). One book that contains many chapters that will be covered in class, *Estimating Causal Effects Using Experimental and Observational Design* (Barbara Schneider et al. 2007), can be found in its entirety here: <http://www.aera.net/Portals/38/docs/Causal%20Effects.pdf>

If you are looking for a good general introduction to research methods with an emphasis on quantitative research, I recommend:
Creswell, John W. 2013. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE Publications.

Most if not all of the assigned journal articles are available for download through the NYU Library e-journal portal: http://library.nyu.edu/collections/find_ejournals.html. I will provide copies of readings, or direct links to the article source, on NYU Classes. Class discussion will focus on the assigned readings, so please prepare for each meeting by reading the assigned articles before class.

**HOW TO
APPROACH
READINGS**

Assigned readings should be accessible to any graduate student with some familiarity with quantitative methods and general knowledge of education policy. However, some readings will use sophisticated statistical techniques with which you may be unfamiliar. Instead of focusing on statistical details, it is better to focus on these objectives:

- be able to identify the specific research question that is being addressed, or hypothesis that is being tested
 - be able to explain in simple terms (not mathematical) the methods the author(s) are using to answer their research question or test their hypothesis
 - be able to describe what data the author(s) use (if any) to address their research question
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**COURSE
FORMAT**

The majority of classes will be divided into three sections:

- The first section will involve lecture on the day's topic
 - The second section will involve discussion of assigned readings / modeling of statistical analyses in class
 - The third section will involve group presentations and discussions of paper (more explained below)
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**COURSE
REQUIREMENTS**

Your grade for this course will be determined as follows:

- Three written problem sets (10% each for a total of 30%)
 - Recitation presentation (total of 15%)
 - Written research review (15%)
 - Midterm and final exam (20% each for a total of 40%)
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**STATA AND
VIRTUAL
COMPUTER LAB**

Many of the assignments for the course will require use of Stata, a statistical software package. To access Stata:

First, NYU has a service called the Virtual Computer Lab that provides access to university-licensed software from anywhere with an NYU student login. You can access this site through NYUHome, or here: <https://vcl.nyu.edu/vpn/index.html>. You can access Stata, as well as other useful software such as Microsoft Excel, from this website. However, the number of concurrent users of Stata at any given time across the university is 50.

Second, you can purchase a 6-month license of Stata for \$35. More information can be found on this website:

<http://www.stata.com/order/new/edu/gradplans/student-pricing/>

The 6-month license of "Small Stata" is sufficient for this course.

GRADING

As a rule, no late assignments will be accepted. A late or incomplete assignment (barring unforeseen hardship, which will need to be documented) will result in a failing grade for the assignment, and possibly the course. If you are absent for class on a day when an assignment is due, the assignment must be turned in BEFORE class; otherwise, the assignment will not be considered submitted. The same rules apply for exams.

OTHER POLICIES

Please make an effort to be on time and please turn off your cell phone—and other digital distractions—while in class (I will do the same). *Responsible* use of a laptop in class is welcomed and encouraged.

NYU and Steinhardt policies toward academic integrity will be strictly enforced in this class. You can find the school's official statement on academic integrity here:
http://steinhardt.nyu.edu/policies/academic_integrity.

You are encouraged to study and work together on homework assignments, but all work submitted must be your individual work.

Please see me immediately if you have any conflicts with scheduled assignments and/or exams, or if you anticipate being absent due to religious observances.

If you wish to withdraw from this course, please do so formally with the University Registrar. If you withdraw without authorization, you are at risk for receiving an “F” for the course.

Any student attending NYU who needs an accommodation due to a chronic psychological, visual, mobility and/or learning disability, or is Deaf or Hard of Hearing, should register with the Moses Center for Students with Disabilities at 212-998-4980, 726 Broadway, 2nd floor (www.nyu.edu/csd).

RESEARCH REVIEW INSTRUCTIONS

RECITATION PRESENTATION

Each week, a group consisting of 1 or 2 students will be responsible for leading an informal discussion of an empirical study related to that week's lecture during recitation. These papers have been chosen for you, and are indicated by an “(R)” on the reading list. Your group will be responsible for delivering a presentation of the paper's main ideas, and facilitating a recitation discussion of the paper. The day before the presentation (Wednesday), each student must submit a 3-page written research review. *This should be submitted to Emily via NYU Classes, in PDF format.*

Each group will be responsible for delivering a 10 minute presentation of the paper's main ideas, and facilitating a 10 minute discussion of the paper, with help from Emily. I recommend that you create a brief PowerPoint presentation, as this will help you organize ideas.

All members of the group are expected to participate in the presentation and discussion. Credit for the research review is contingent upon active participation.

CHOOSING A REVIEW PAPER

In the first week of class, you will have an opportunity to sign up for a research paper I encourage you to select a paper topic that interests you.

It goes without saying that you should not choose a presentation date on which you expect to be absent. We do need volunteers to begin presenting in the second week (during recitation). Rest assured that those presenting early in the semester will not be penalized for their lack of exposure to the course material!

WRITTEN REVIEW

Each student must submit a 3-page research review one day prior to the class presentation (double-spaced, with 1” margins and 11 or 12 point font size). The research review is a written synthesis that describes and critically analyzes a piece of empirical research. Suggestions on how to approach the review are provided below.

Though you will be working in groups, *your submitted written review must be your own individual work.* That is, we will not accept a collective review.

GUIDELINES

Your presentation and review should address the following types of questions:

- What is the specific research question that is being addressed?
- Why is this an interesting research question?
- Is there an underlying theory that motivates this empirical study?
- Are the authors using data to test some hypothesis? If so, what is the hypothesis?
- What kind of data does the author(s) use? Where did it come from?

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- Many of the papers you will look at perform regression analysis—if so, what is the *dependent variable* (that is, what variable or outcome are they trying to explain) and what are the key *explanatory variables*?
 - Is the data observed and non-experimental in nature, or the product of a randomized experiment?
 - What is the paper's key empirical finding?
 - Is there anything that the authors do to convince you that they have found a *causal* relationship between their dependent variable and explanatory variable of interest, and not a simple correlation?
 - Is there anything you find unconvincing about the paper? Can you think of an alternative explanation for the key empirical finding?
 - Are there any policy implications from the results of the paper?

A good way to approach the research review is to assume you are writing for interested parties who are not familiar with the academic literature and are not quantitative experts of any kind. They have asked you to write and present this paper to bring out the key points, salient issues, and implications for public policy.

Avoid using jargon, or repeating technical language.

COURSE OUTLINE AND READING LIST

(*) = required reading (all other are recommended)

(R) = research review article and recitation presentation article

- January 25**
Lecture 1
General introduction
Note: no recitation this week
- February 1**
Lecture 2
Statistics: Displaying categorical data
Content: International comparisons (1)
* (R) OECD. 2012. *PISA 2012 Results in Focus: What 15-Year-Olds Know and What They Can Do with What They Know*.
<http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview.pdf>.
* Buckley, Jack (NCES). 2012. "Highlights from IRLS and TIMSS 2011".
Powerpoint Presentation, Washington, DC.
- Problem Set 1
handed out
- February 8**
Lecture 3
Statistics: Exploring the relationship of two categorical variables / hypothesis testing
Content: Social Mobility
* (R) Haveman, Robert H., and Timothy M. Smeeding. 2006. "The Role of Higher Education in Social Mobility." *The Future of Children* 16(2): 125-150.
* Perry, Laura, and Andrew McConney. 2010. "Does the SES of the School Matter? An Examination of Socioeconomic Status and Student Achievement Using PISA 2003." *The Teachers College Record* 112 (4): 7-8.
- February 15**
Lecture 4
Problem Set 1
due
Statistics and Content: Causal inference
* (R) Schneider, Barbara, et al. 2007. *Estimating Causal Effects: Using Experimental and Observational Designs*. American Educational Research Association. Pp. 9-18
* Rothman, Kenneth, and Sander Greenland. 2005. "Causation and Causal Inference in Epidemiology." *American Journal of Public Health* 95 (S1): S144-S150.
- February 22**
Lecture 5
Statistics: Regression analyses (1): when the relationships involve more than just two parties
Content: Racial/ethnic differences in academics
* (R) Ainsworth-Darnell, James W., and Douglas B. Downey. 1998. "Assessing the Oppositional Culture Explanation for Racial/ethnic Differences in School Performance." *American Sociological Review*, 536-53.
* Kao, Grace, and Jennifer S. Thompson. 2003. "Racial and Ethnic Stratification in Educational Achievement and Attainment." *Annual Review of Sociology* 29 (1): 417-42.
Warikoo, Natasha, and Prudence Carter. 2009. "Cultural Explanations for Racial and Ethnic Stratification in Academic Achievement: A Call for a New and Improved Theory." *Review of Educational Research* 79 (1): 366-94.
- March 1**
Lecture 6
Statistics: Regression analyses (2)
Content: International comparisons (2)

- * (R) Buchmann, Claudia, and Hyunjoon Park. 2009. "Stratification and the Formation of Expectations in Highly Differentiated Educational Systems." *Research in Social Stratification and Mobility* 27 (4): 245–67.
- * Woessmann, Ludger. 2011. "Cross-Country Evidence on Teacher Performance Pay." *Economics of Education Review* 30 (3): 404–18.

March 8
Lecture 7

Statistics: Regression analyses and interactions: when relationships differ
Content: Gender, poverty and education in China

- * (R) Hannum, E. 2003. "Poverty and Basic Education in Rural China: Villages, Households, and Girls' and Boys' Enrollment." *Comparative Education Review* 47 (2): 141–59.
- * Cherng, Hua-Yu Sebastian, and Emily Hannum. 2013. "Community Poverty, Industrialization, and Educational Gender Gaps in Rural China." *Social Forces* 92(2): 659-690.
- Brown, P. H., and A. Park. 2002. "Education and Poverty in Rural China." *Economics of Education Review* 21 (6): 523–41

March 15

Spring break
Note: no class and recitation this week

March 22
Problem Set 2
handed out

Midterm Exam
Note: no recitation this week

March 29
Lecture 8

Statistics: Panel / longitudinal data and regression analysis and scales
Content: Study abroad

- * (R) Martinsen, R. A. (2010). Short-Term Study Abroad: Predicting Changes in Oral Skills. *Foreign Language Annals*, 43: 504–530.
- * Chieffo, L. & Griffiths, L. (2003). Large-Scale Assessment of Student Attitudes After a Short-Term Study Abroad Program. *The Interdisciplinary Journal of Study Abroad*.

April 5

Lecture 9
Problem Set 2
due

Statistics: Hierarchical Linear Modeling (HLM)
Content: School effects

- * (R) Lee, Valerie E. 2000. "Using Hierarchical Linear Modeling to Study Social Contexts: The Case of School Effects." *Educational Psychologist* 35 (2): 125–41.
- * Ready, Douglas D. 2010. "Socioeconomic Disadvantage, School Attendance, and Early Cognitive Development The Differential Effects of School Exposure." *Sociology of Education* 83 (4): 271–86.
- Bidwell, Charles E., and John D. Kasarda. 1975. "School District Organization and Student Achievement." *American Sociological Review* 40 (1): 55–70.

April 12
Lecture 10
Problem Set 3
handed out

Statistics: Randomized control trials and its critiques
Content: School and curriculum effects

- * (R) Burde, Dana. 2012. "Assessing Impact and Bridging Methodological Divides: Randomized Trials in Countries Affected by Conflict." *Comparative Education Review* 56 (3): 448–73.
- * Lareau, Annette. 2008. "Narrow Questions, Narrow Answers: The Limited Value of Randomized Controlled Trials for Education Research."

Education Research on Trial: Policy Reform and the Call for Scientific Rigor, 145.

- * Schneider et al. 2007. *Estimating Causal Effects*. Pp. 18-32
- * Glewwe, Paul, Michael Kremer, and Sylvie Moulin. 2009. "Many Children Left behind? Textbooks and Test Scores in Kenya." *American Economic Journal: Applied Economics* 1 (1): 112–35.

April 19

Lecture 11

Statistics: Quasi-experimental design: Propensity score matching

Content: Returns to higher education

- *(R) Titus, Marvin A. 2007. "Detecting Selection Bias, Using Propensity Score Matching, and Estimating Treatment Effects: An Application to the Private Returns to a Master's Degree." *Research in Higher Education* 48 (4): 487–521
- * Schneider et al. 2007. *Estimating Causal Effects*. Pp. 49-52
- * Melguizo, Tatiana, Gregory S. Kienzl, and Mariana Alfonso. 2011. "Comparing the Educational Attainment of Community College Transfer Students and Four-Year College Rising Juniors Using Propensity Score Matching Methods." *The Journal of Higher Education* 82 (3): 265–91.

April 26

Lecture 12

Problem Set 3
due

Statistics: Quasi-experimental design: Regression discontinuity

Content: High-stakes testing

- *(R) Conger, Dylan. 2013. "The Effect of Grade Placement on English Language Learners' Academic Achievement." *Educational Evaluation and Policy Analysis* 35 (4): 395-412.
- * Reardon, Sean F., Nicole Arshan, Allison Atteberry, and Michal Kurlaender. 2010. "Effects of Failing a High School Exit Exam on Course Taking, Achievement, Persistence, and Graduation." *Educational Evaluation and Policy Analysis* 32 (4): 498–520.

May 3

Final exam