

**Carnegie Mellon University
Heinz College**

90-712 Quantitative Analysis of Income Inequality

Course Syllabus, Fall 2024

INSTRUCTOR

Felix Koenig

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Office hours: TBD

SCHEDULE

Lectures: 11:00 am – 12:20 pm Monday and Wednesday, in HBH 1208.

Recitation: Friday 9:30 am – 10:50 am in HBH 1208

TEACHING ASSISTANT

TBD

OVERVIEW

Economic inequality has risen to historic levels in recent decades, becoming a pressing issue in political debates and a key topic in economics. The objective of this course is to give students an overview of recent research on inequality and introduce students to the data and analysis used to understand inequality. The class covers three sets of topics:

- 1) How has inequality evolved in recent decades? And how do we identify reliable data sources to measure inequality? Students will analyze data using R, Stata, or Python and work with data used for policy assessments. They will also learn to assess the strengths and weaknesses of empirical findings.
- 2) What explains economic inequality and its trend? We will focus on the role of traditional market forces (globalization, technological change, robots, etc.) and labor market institutions (such as minimum wages, unions).
- 3) What is the impact of possible interventions and policies targeting inequalities? We will look at the effects of unions, tariffs on imports, free college education, minimum wages, and taxes on top earners.

Throughout the course, students will be introduced to econometric methods used in contemporary inequality research, as well as basic methods in data science, including regression analysis and causal inference. The course aims to equip students with a working knowledge of economic theories related to inequality, develop their empirical skills for analyzing and interpreting data on economic inequality, and enhance their ability to communicate quantitative results and critically evaluate existing research.

LEARNING OBJECTIVES

This class provides students with an overview of recent research on income inequality and evaluates policies that aim to promote mobility and reduce inequality. The class will prepare students to:

1. Evaluate the effectiveness of data and methods used to measure inequality.
2. Study the role of technological change, unions, minimum wages and similar institutions on labor market outcomes.
3. Understand data tools to make causal statements.
4. Apply the causal inference toolkit to evaluate research and policy claims about the causes of inequality.
5. Develop effective written communication and the ability to summarize data-based research for policy purposes.

PREREQUISITES

Training in microeconomics and statistics - for example, from the core first-year classes at Heinz or similar classes elsewhere. Classwork will require familiarity with a statistics program, e.g., Stata, R, SAS, Python (a library like Pandas), or something similar.

COURSE ORGANIZATION

Web site: This course will use the **Canvas system** (<https://canvas.cmu.edu/>). As of the first day of class, all registered students should have complete access to the course website. Important class information, including readings and copies of the lecture notes, will be distributed regularly via this website.

Recordings: This class takes place in person. We aim to record lectures for review purposes or for special circumstances. These recordings are not an alternative to in-class attendance.

Technology: The class will present code and requires you to work with datasets. This class requires you to bring a laptop that runs R, Stata, or Python. If there is a gap in your technology set-up, make sure to contact the Heinz computing team (heinz-computing@andrew.cmu.edu).

Reading materials: All readings will be available through Canvas. Required readings should be completed before the associated lecture, and students must be prepared to discuss the readings during lecture. Supplemental readings are generally much longer than the required readings and provide more in-depth information for the interested student.

Missing class A student who misses class due to medical problems should come forward as soon as possible, and no later than one week after returning to class, or should notify me by email if the absence is extended beyond one week.

Evaluation

Grading summary:

Exams	50%
Homework	20%
Course Project	25%
Participation	5%

The course grade will be based on the following: two equally weighted in-class examinations (25% each), a class project (25%), Homework assignments (20%) and class participation (5%).

Homework assignments will occur regularly and will be announced in class. They are due on Monday at 10:30 a.m. (aka before the class). The assignments are typically posted on Canvas one week before the due date. Late assignments will receive no credit. The lowest homework score (including late or missed assignments) will not count towards the course grade.

Course projects: For the class project, you will be assigned a recent research paper on inequality and will write a “policy brief” summarizing the paper. Your summary should cover the main question, key findings, and a high-level summary of the data source and empirical approach. Do not get hung up on technical details; pitch the summary as if you were briefing a policymaker about a recent research insight.

In the second step, you will prepare a 15-minute flash presentation summarizing the paper. You will work with other students who worked on the same paper. The grading includes a peer evaluation component, and grades will be adjusted up or down to account for each team member's contribution. Note that points will be deducted for presentations longer than 15 minutes.

POLICIES

Please be courteous to your fellow students by arriving on time. We have a lot of material to cover in a short amount of time, and I plan to start and end class on time. This requires you to be on time. Attendance is required, and students are expected to have completed the relevant

readings and to be engaged in class discussions (see above regarding class participation in grading).

Students are discouraged from using laptops or other technology, except for the purposes of taking notes. Please do not use class time to check e-mail, trade stocks, or play video games. Similarly, only use your phones for class participation (see note above). If you have a special situation that requires constant communication, please let me know.

All sources used for written assignments must be appropriately cited based on standard citation guidelines and CMU policies. Students are responsible for knowing how to cite sources appropriately. The official university definitions of cheating and plagiarism and sanctions for any violations are described here: <https://www.cmu.edu/policies/student-and-student-life/academic-integrity.html>. See me if you have any questions about appropriate citation **before** handing in an assignment.

DIVERSITY

It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength, and benefit. I aim to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In addition, if any of our class meetings conflict with your religious events, please let me know so that we can make arrangements for you.

Each of us is responsible for creating a safer, more inclusive environment. Unfortunately, incidents of bias or discrimination do occur, whether intentional or unintentional. They contribute to creating an unwelcoming environment for individuals and groups at the university. Therefore, the university encourages anyone who experiences or observes unfair or hostile treatment on the basis of identity to speak out for justice and support, within the moment of the incident or after the incident has passed. Anyone can share these experiences using the following resources:

- Center for Student Diversity and Inclusion: csdi@andrew.cmu.edu, (412) 268-2150
- The CMU online platform "Report-It" for anonymous reporting

Accommodations for Students with Disabilities:

If you have a disability and have an accommodations letter from the Disability Resources office, I encourage you to discuss your accommodations and needs with me as early in the semester as possible. I will work with you to ensure that accommodations are provided as appropriate. If you suspect that you may have a disability and would benefit from accommodations but are not yet registered with the Office of Disability Resources, I encourage you to contact them at access@andrew.cmu.edu.

FEELING ANXIOUS OR STRESSED

Sometimes course work and life events can feel overwhelming. If you feel stressed or are experiencing problems, please do reach out! CMU offers a wide range of support. CaPS provides personal and private support sessions for all types of life situations. This goes from simply having someone to talk to, to addressing specific problems. As a student, I worked with the counseling service and they offer wonderful personalized support.

Do watch out for each other. If you or anyone around you experiences severe stress, difficult life events, or is feeling anxious or depressed, please seek support. Counseling and Psychological Services (CaPS) is a great point of contact: call 412-268-2922 and visit <http://www.cmu.edu/counseling/>. Also consider reaching out to a friend, faculty or family member you trust for help.

If you or someone you know is feeling suicidal or in danger of self-harm, call someone immediately, day or night:

CaPS: 412-268-2922

Re:solve Crisis Network: 888-796-8226

If the situation is life threatening, call the police

On campus: CMU Police 412-268-2323

Off campus: 911

This is a tentative schedule that is subject to change. Any changes will be announced in class and on Canvas.

Date	Topic	Methods/Concepts	comment
<i>Week 1</i>			
<i>Measuring economic inequality</i>			
Aug 26	Introduction	Labor share, DINA, Market income, permanent income	
Aug 28	Lab: Inequality of income vs inequality of opportunity		Coding session
<i>Week 2</i>			
Sep 2	No Class – Labor Day		
Sep 4	Economics of Intergenerational Mobility		Guest Lecture
<i>Week 3</i>			
Sep 9	Lab: How to Measure Inequality	Gini, percentile ratios, variance decomposition	Coding session
Sep 11	Causality	Missing counterfactual, Selection bias, ATT, OVb	
<i>Week 4</i>			
<i>Why has US income inequality increased? The role of market forces</i>			
Sep 16	Education and technology	Mincer Regression, Tinbergen race	
Sep 18	Education and technology II		
<i>Week 5</i>			
Sep 23	Lab: Estimating OLS	OLS, binary variable coefficients	Coding session
Sep 25	Automation and robots	Differences in Differences	
<i>Week 6</i>			

Sep 30 Top incomes and taxes
Oct 2 Top incomes and taxes II

Week 7

Oct 7 Buffer
Oct 9 Mid-Term Exam

Week 8

Oct 14 **Fall Break**
Oct 16 **Fall Break**

Week 9

Why has US income inequality increased? The role of policy and institutions

Oct 21 Inequality and Firms Fixed Effect estimates
Oct 23 Wage Gaps and Imperfect Information

Week 10

Oct 28 Unions
Oct 30 Unions II

Week 11

Nov 4 Student Presentation
Nov 6 Minimum Wage

Week 12

Nov 11 Buffer
Nov 13 Buffer

Week 13

Racial inequality

Nov 18 Between group inequality: Racial inequality Blinder-Oaxaca decomposition
Nov 20 Lab: Blinder Oaxaca

Week 14

Nov 25 Student Presentations
Nov 27 **Thanksgiving Break**

Week 15

Dec 2 Theories of racial discrimination
Dec 4 Lab: audit studies **Coding session**

Finals

Dec 9 - 13

READINGS

Readings will be available on Canvas. I may add additional readings as we go along.

Week 1: Introduction

Required

Blanchet, T., Chancel, L., and Gethin, A. (2022). Why Is Europe more equal than the United States? *American Economic Journal - Applied Economics*, 14(4), 480 – 518.

Owyang, M. and Shell, H. (2016). Measuring trends in income inequality. *The Regional Economist*

Supplemental

Berman, Y. (2022). On the link between intergenerational mobility and inequality: Are they truly distinct? Unpublished working paper.

Boushey, Holtz-Eakin, Zucman, and Zwick (2019) (from min 45) “Measuring economic inequality in the United States” US Congressional testimony:

<https://www.youtube.com/watch?v=g8U5DW6iwII#action=share>

Chetty, R., Jackson, M. O., Kuchler, T., Stroebel, J., Hendren, N., Fluegge, R. B., Gong, S., Gonzalez, F., Grondin, A., Jacob, M., Johnston, D., Koenen, M., Laguna-Muggenburg, E., Mudekereza, F., Rutter, T., Thor, N., Townsend, W., Zhang, R., Bailey, M., ... Wernerfelt, N. (2022). Social capital I: measurement and associations with economic mobility. *Nature*, 608(7921), 108–121.

Berman, Y. (2022). The long-run evolution of absolute intergenerational mobility. *American Economic Journal: Applied Economics*, 14(3), 61 – 83.

Week 2: Measuring Inequality

Required

Methodology readings

Mastering ‘Metrics Chapters 1 and 2

Topical readings

Auten, G., and Splinter, D. (2019). Top 1 percent income shares: Comparing estimates using tax data. *American Economic Review Papers and Proceedings*, 109, 307–311.

Economist (2019). Measuring the top 1% - Economists are rethinking the numbers on inequality. Published Nov 28th 2019.

Krueger, A. (2015). The great utility of the Great Gatsby curve. Brookings Institute Social Mobility Memos

Mathur, A. (2015). Families are the real issue for opportunity, not inequality. Brookings Institute Social Mobility Memos

Supplemental

Gould, E. (2019) State of working America - Wages 2019. *Economic Policy Institute*

Stone, C., Trisi, D., Sherman, A., and Beltran, J. (2020). A guide to statistics on historical trends in income inequality. *Center on Budget and Policy Priorities Policy Futures*

Week 3 & 4: Racial Inequality

Required

Methodology readings

Jann (2008) – The Blinder Oaxaca decomposition for linear regression models. *The STATA Journal*, 8(4), 453 – 479. [Only sections 1 and 2]

Topical readings

Agan, A. (2017) “The Problem with Ban the Box” Vox video summary - <https://www.youtube.com/watch?v=Rz73rBG9ggA>

Kasy, M. (2020) “Empirical Research on Economic Inequality, Chapter 5 Discrimination – Experiments” <http://inequalityresearch.net/discrimination.html>

Supplemental

Chetty et al. (2018) “The Intergenerational Persistence of Racial Disparities” [http://www.kaltura.com/index.php/extwidget/preview/partner_id/1449362/uiconf_id/14292362/entry_id/1_o5sxq7eg/embed/auto?&flashvars\[streamerType\]=auto](http://www.kaltura.com/index.php/extwidget/preview/partner_id/1449362/uiconf_id/14292362/entry_id/1_o5sxq7eg/embed/auto?&flashvars[streamerType]=auto)

Derenoncourt, E., Kim, C., Kuhn, M., and Schularick, M. (2022). Wealth of two nations: The U.S. racial wealth gap, 1860 - 2020. NBER Working Paper No. 30101.

Fryer, R. G. (2018). Reconciling results on racial differences in police shootings. *AEA Papers and Proceedings*, 108, 228–233.

Fryer, R. G. (2019). An empirical analysis of racial differences in police use of force. *Journal of Political Economy*, 127(3), 1210–1261.

Lieberman, C. (2020). Variation in racial disparities in police use of force. Princeton IRS working paper 639.

Week 5: Education, Technology, and Automation

Required

Autor, D., Goldin, C., & Katz, L. (2020). Extending the race between education and technology. *American Economic Review Papers and Proceedings*, 49–54.

Dynarski (2019) The power of promising free tuition. Vox video summary - https://www.youtube.com/watch?v=66UwN_rpgss

Dynarski et al (2019) Attracting low-income students to top universities. *NBER Digest Supplemental Reading*

Week 6: Automation and Top Incomes

Required

Methodology readings

Mastering 'Metrics Chapter 5

Topical readings

Acemoglu, D., Manera, A., and Restrepo, P. (2020) Does the U.S. tax code favor automation? *Brookings Papers*

Autor, D. H. (2022). The labor market impacts of technological change: From unbridled enthusiasm to qualified optimism to vast uncertainty. NBER Working Paper No. 30074.

Dizikis, P (2020). Study finds stronger links between automation and inequality. *MIT News Office*

Horton, J. "AI, labor, and the parable of the horse" <http://john-joseph-horton.com/ai-labor-and-the-parable-of-the-horse/>

Supplemental

Kuhn, Schularick, and Steins (2020) Video summary from 2019 (from hour 1:50 to 1:57; full talk 1:39 to 2:09) - <https://www.youtube.com/watch?v=uIQxMI7sOLk&feature=youtu.be>

Week 7:

Readings TBD