

Applied Econometrics (PhD)

Module 1, 2025-2026

Course Information

Instructor: Liang Chen

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Office Hour: 9:00-10:00, Monday to Friday (or by appointment)

Teaching Assistant:

Phone:

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Classes:

Lectures: Tuesday & Friday, 10:30 – 12:20

Venue: PHBS Building

Course Website:

If any.

1. Course Description

1.1 Context

Course overview: This course will focus on econometric methods that are widely applied in empirical economic research. There are two key elements in this course: (i) cutting-edge econometric models and methods; (ii) classical papers that applied these methods. The students will obtain a solid understanding of the theory behind the methods, and will also know how to apply these methods by reading and replicating highly influential empirical papers published in top economic journals.

Prerequisites: mathematics, statistics, PhD-level econometrics.

1.2 Textbooks and Reading Materials

Causal Inference, The Mixtape, by Scott Cunningham.

The book is available at: <https://mixtape.scunning.com/>

2. Learning Outcomes

2.1 Intended Learning Outcomes

Learning Goals	Objectives	Assessment (YES with details or NO)
1. Our graduates will be effective	1.1. Our students will produce quality business and research-oriented documents.	Yes

communicators.	1.2. Students are able to professionally present their ideas and also logically explain and defend their argument.	Yes
2. Our graduates will be skilled in team work and leadership.	2.1. Students will be able to lead and participate in group for projects, discussion, and presentation.	Yes
	2.2. Students will be able to apply leadership theories and related skills.	Yes
3. Our graduates will be trained in ethics.	3.1. In a case setting, students will use appropriate techniques to analyze business problems and identify the ethical aspects, provide a solution and defend it.	Yes
	3.2. Our students will practice ethics in the duration of the program.	Yes
4. Our graduates will have a global perspective.	4.1. Students will have an international exposure.	Yes
5. Our graduates will be skilled in problem-solving and critical thinking.	5.1. Our students will have a good understanding of fundamental theories in their fields.	Yes
	5.2. Our students will be prepared to face problems in various business settings and find solutions.	Yes
	5.3. Our students will demonstrate competency in critical thinking.	Yes

2.2 Course specific objectives

2.3 Assessment/Grading Details

Class participation: 10%

Individual Presentation: 30%

Final assignment: 60%

2.4 Academic Honesty and Plagiarism

It is important for a student's effort and credit to be recognized through class assessment. Credits earned for a student work due to efforts done by others are clearly unfair. Deliberate dishonesty is considered academic misconducts, which include plagiarism; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; or altering, forging, or misusing a University academic record; or fabricating or falsifying of data, research procedures, or data analysis.

All assessments are subject to academic misconduct check. Misconduct check may include reproducing the assessment, providing a copy to another member of faculty, and/or communicate a copy of this assignment to the PHBS Discipline Committee. A suspected plagiarized document/assignment submitted to a plagiarism checking service may be kept in its database for future reference purpose.

Where violation is suspected, penalties will be implemented. The penalties for academic misconduct may include: deduction of honour points, a mark of zero on the assessment, a fail grade for the whole course, and reference of the matter to the Peking University Registrar.

AI tools requirements:

Using AI tools to complete assignments or assessments without the approval of the course instructor will be regarded as an act of academic dishonesty. Depending on the severity of the situation, penalties will be implemented in accordance with the provisions of the Peking University Graduate Student Handbook.

For more information of plagiarism, please refer to *PHBS Student Handbook*.

3. Topics, Teaching and Assessment Schedule

Week 1: Introduction, Research Design, and Directed Acyclic Graphs

Week 2: Potential Outcomes Causal Model

Week 3: Instrumental Variables

Week 4: Instrumental Variables

Week 5: Regression Discontinuity Design

Week 6: Regression Discontinuity Design

Week 7: Panel Data

Week 8: Difference-in-Difference: I

Week 9: Difference-in-Difference: II

4. Reading List

RCT

- Krueger, A. B. (1999). Experimental estimates of education production functions. The Quarterly Journal of Economics, 114(2), 497-532.
- Bertrand, M., & Mullainathan, S. (2004). Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination. American Economic Review, 94(4), 991-1013.
- Ho, D. E., & Imai, K. (2006). Randomization inference with natural experiments: An analysis of ballot effects in the 2003 California recall election. Journal of the American Statistical Association, 101(475), 888-900.
- Chen, Y., & Yang, D. Y. (2019). The impact of media censorship: 1984 or brave new world? American Economic Review, 109(6), 2294-2332.

Instrumental Variables

- Angrist, J. D. (1990). Lifetime earnings and the Vietnam era draft lottery: evidence from social security administrative records. The American Economic Review, 313-336.
- Angrist, J. D., & Krueger, A. B. (1991). Does compulsory school attendance affect schooling and earnings? The Quarterly Journal of Economics, 106(4), 979-1014.
- Angrist, J., & Evans, W. (1998). Children and Their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size. American Economic Review, 88(3), 450-77.
- Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. American Economic Review, 91(5), 1369-1401.
- Carneiro, P., Heckman, J. J., & Vytlacil, E. J. (2011). Estimating marginal returns to education. American Economic Review, 101(6), 2754-2781.

Regression Discontinuity Designs

- Dell, M. (2010). The persistent effects of Peru's mining MITA. Econometrica, 78(6), 1863-1903.
- Chen, Y., Ebenstein, A., Greenstone, M., & Li, H. (2013). Evidence on the impact of sustained exposure to air pollution on life expectancy from China's Huai River policy. Proceedings of the National Academy of Sciences, 110(32), 12936-12941.
- Dell, M. (2015). Trafficking networks and the Mexican drug war. American Economic Review, 105(6), 1738-1779.
- Dell, M., & Querubin, P. (2018). Nation building through foreign intervention: Evidence from

discontinuities in military strategies. The Quarterly Journal of Economics, 133(2), 701-764.

- ♦ He, G., Wang, S., & Zhang, B. (2020). Watering down environmental regulation in China. The Quarterly Journal of Economics, 135(4), 2135-2185.

Panel Data

- ♦ Acemoglu, D., Naidu, S., Restrepo, P., & Robinson, J. A. (2019). Democracy does cause growth. Journal of Political Economy, 127(1), 47-100.
- ♦ Waldinger, F. (2012). Peer effects in science: Evidence from the dismissal of scientists in Nazi Germany. The Review of Economic Studies, 79(2), 838-861.
- ♦ 姚洋, 张牧扬 (2013)。官员绩效与晋升锦标赛 --- 来自城市数据的证据。 经济研究。
- ♦ Belenzon, S., Chatterji, A. K., & Daley, B. (2017). Eponymous entrepreneurs. American Economic Review, 107(6), 1638-1655.

Bartik IV

- ♦ Autor, D. H., Dorn, D., & Hanson, G. H. (2013). The China syndrome: Local labor market effects of import competition in the United States. American Economic Review, 103(6), 2121-2168.
- ♦ Nunn, N., & Qian, N. (2014). US food aid and civil conflict. American Economic Review, 104(6), 1630-1666.
- ♦ Acemoglu, D., & Restrepo, P. (2020). Robots and jobs: Evidence from US labor markets. Journal of Political Economy, 128(6), 2188-2244.

Difference in Difference

- ♦ Di Tella, R., & Schargrodsky, E. (2004). Do police reduce crime? Estimates using the allocation of police forces after a terrorist attack. American Economic Review, 94(1), 115-133.
- ♦ Galiani, S., Gertler, P., & Schargrodsky, E. (2005). Water for life: The impact of the privatization of water services on child mortality. Journal of Political Economy, 113(1), 83-120.
- ♦ Gentzkow, M. (2006). Television and voter turnout. The Quarterly Journal of Economics, 121(3), 931-972.
- ♦ Qian, N. (2008). Missing women and the price of tea in China: The effect of sex-specific earnings on sex imbalance. The Quarterly Journal of Economics, 123(3), 1251-1285.
- ♦ Cao, Y., & Chen, S. (2022). Rebel on the canal: Disrupted trade access and social conflict in China, 1650–1911. American Economic Review, 112(5), 1555-1590.
- ♦ Braghieri, L., Levy, R. E., & Makarin, A. (2022). Social media and mental health. American Economic Review, 112(11), 3660-3693.
- ♦ Allen, R. C., Bertazzini, M. C., & Heldring, L. (2023). The economic origins of government. American Economic Review, 113(10), 2507-2545.