

## **ELECTIVE COURSE**

### **Course Title:**

ADVANCED ECONOMETRICS FOR PUBLIC POLICY

### **Course Description:**

This course explores experimental and quasi-experimental research designs in social science, focusing on randomized control trials, regressions, propensity score matching, instrumental variable (IV) design, regression discontinuity design (RDD), panel data analysis, and the difference-in-difference (DID) approach. Through theory, labs, and paper analysis, students gain deep understanding and skills for effective research design and interpretation for public policy.

### **Instructor Information:**

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### **Course Objectives:**

- Introduce students to experimental and quasi-experimental research designs in social science.
- Deepen understanding of concepts like randomization, causal inference, and endogeneity.
- Equip students with practical skills through hands-on lab sessions, fostering critical thinking and enabling effective design, execution, and interpretation of research studies for evidence-based decision-making in social science.

### **Course Content:**

1. Randomized Control Trial (RCT)
2. Regressions for RCTs
3. Lab Session 1- RCTs and Regressions
4. Propensity score matching, Matching v/s Regression
5. Lab Session 2- Matching
6. Instrumental Variable (IV) design and 2SLS
7. Lab Session 3- IVs
8. Regression discontinuity design (RDD)
9. Lab Session 4- RDD
10. Engaging with panel data- fixed and random effects model
11. The Difference-in-difference approach (DID)
12. Lab Session 5- Panel Data analysis and DID
13. Academic Paper Discussion
14. Academic Paper Presentations by Students

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### **References:**

- Angrist, Joshua D., and Jorn-Steffen Pishke. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press, 2008.
- Angrist, Joshua D., and Jörn-Steffen Pischke. *Mastering 'metrics: The Path from Cause to Effect*. Princeton University Press, 2014.
- Wooldridge, Jeffrey M. *Introductory econometrics: A Modern Approach*. Nelson Education, 2015.

The first two books will be the main references, the last one to be used for select topics. Besides the above, students will be expected to read seminal academic papers, which will be shared as the course progresses.