Econometrics in Advanced Causal Inference Techniques Training Course

Professional Development Training Course Outline

Category	Research and Data Analysis	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In an era where data-driven decision-making defines competitive advantage, mastering advanced causal inference techniques in econometrics is essential for researchers, analysts, and policymakers. Econometrics in Advanced Causal Inference Techniques Training Course is a cutting-edge, expert-level program designed to equip participants with the skills to identify, estimate, and interpret complex causal relationships using real-world data. Leveraging state-of-the-art methodologies such as instrumental variables, regression discontinuity, difference-in-differences, and machine learning-based causal inference, this course bridges theoretical rigor with practical application.

Participants will delve deep into contemporary challenges in causal inference while using statistical software like R, Python, and Stata. With hands-on case studies, real-world simulations, and curated datasets, learners will emerge with advanced econometric knowledge, ready to tackle high-impact questions in economics, policy, business, and the social sciences. The course prioritizes evidence-based analysis, causal effect estimation, and policy evaluation, making it highly relevant in both academic and professional contexts.

Programme Curriculum

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Course Objectives

1. Understand the foundations of causal inference and distinguish causation from correlation.
2. Master instrumental variable (IV) estimation techniques and their assumptions.
3. Apply difference-in-differences (DiD) methods in policy impact evaluations.
4. Implement regression discontinuity designs (RDD) in real-world settings.
5. Explore panel data approaches for causal inference.
6. Utilize matching methods including propensity score matching.
7. Leverage machine learning tools (e.g., causal forests, targeted learning) for causal estimation.
8. Conduct robust sensitivity analysis to test assumptions.
9. Analyze heterogeneous treatment effects across populations.
10. Understand and apply synthetic control methods for comparative case studies.
11. Interpret causal graphs and directed acyclic graphs (DAGs) for model validation.
12. Use Stata, R, or Python to apply advanced causal inference techniques.
13. Design and evaluate policy interventions based on empirical evidence.

Target Audiences

1. Economists and Economic Researchers
2. Policy Analysts and Government Officials
3. Academic Scholars and Lecturers
4. Data Scientists and Statisticians
5. Graduate Students in Economics or Data Science
6. NGO and Think Tank Researchers
7. Business Intelligence Professionals
8. International Development Consultants

Course Duration: 5 days

Course Modules

Module 1: Introduction to Causal Inference and Potential Outcomes

- Define causality vs. correlation
- Explore Rubin Causal Model
- Identify counterfactuals
- Explain randomization in experiments
- Introduction to observational data techniques
- **Case Study: Evaluating a job training program's impact using randomized control**

Module 2: Instrumental Variables and Endogeneity

- Define and detect endogeneity
- Identify valid instruments
- Apply Two-Stage Least Squares (2SLS)
- Evaluate weak instruments
- Practical implementation in Stata/R
- **Case Study: Effect of education on earnings using quarter of birth as instrument**

Module 3: Difference-in-Differences (DiD)

- Understand parallel trends assumption
- Conduct two-period DiD estimation
- Include covariates and fixed effects
- Use DiD in panel data
- Event study designs
- **Case Study: Policy reform impact on minimum wage employment levels**

Module 4: Regression Discontinuity Design (RDD)

- Sharp vs. fuzzy RDD
- Identify thresholds and cutoff rules
- Graphical analysis and bandwidth selection
- Local polynomial regression
- Running placebo tests
- **Case Study: Student test scores and scholarship eligibility**

Module 5: Matching and Propensity Score Techniques

- Define matching algorithms
- Estimate and interpret propensity scores
- Assess balance and overlap
- Perform nearest neighbor and kernel matching
- Combine with DiD or IV methods
- **Case Study: Health insurance impact using PSM with household survey data**

Module 6: Panel Data and Fixed Effects Models

- Benefits of panel data for causal inference
- Estimate fixed and random effects
- Address unobserved heterogeneity
- Dynamic panel models
- Use software to estimate robust SEs
- **Case Study: Productivity change in firms over time due to policy change**

Module 7: Machine Learning and Causal Inference

- Causal forests and meta-learners
- Double machine learning (DML)
- Use ML to uncover heterogeneous effects
- Model selection and tuning
- Address overfitting in causal models
- **Case Study: Using causal trees to assess microcredit impact**

Module 8: Synthetic Control and DAGs

- Introduction to synthetic control
- Construct donor pools and weights
- DAG theory for causal identification
- Tools for DAG visualization and interpretation
- Combine with other methods
- **Case Study: Analyzing the impact of a terrorism event on tourism using synthetic controls**

Training Methodology

- Interactive lectures and expert-led sessions

- Real-world data projects and simulations
- Hands-on exercises using R, Python, and Stata
- Case study analysis and group discussions
- Personalized feedback and assessment
- Access to downloadable datasets and code templates

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com