Experimental Design and Causal Inference for Applied Research 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 and empirical evidence shape policy and strategic interventions, mastering Experimental Design and Causal Inference is crucial for researchers, policymakers, and analysts. Experimental Design and Causal Inference for Applied Research Training Course equips participants with cutting-edge methodologies and statistical tools to establish causality, design robust experiments, and apply advanced analytical frameworks to real-world scenarios. Leveraging quantitative analysis, randomized controlled trials (RCTs), quasi-experimental designs, and impact evaluation techniques, the course enhances capacity to drive evidence-based outcomes across sectors.

With a blend of theoretical rigor and practical application, participants will explore how to address confounding variables, design experiments in complex field settings, and utilize tools like Propensity Score Matching, Instrumental Variables, and Difference-in-Differences. By the end of the course, participants will possess the analytical acumen to structure experiments, infer causality accurately, and translate findings into actionable insights for policy analysis, social research, development programs, and business analytics.

Programme Curriculum

Experimental Design and Causal Inference for Applied Research Training Course

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Course Objectives

1. Understand the principles of experimental design and its role in applied research.
2. Apply causal inference methodologies for robust impact evaluations.
3. Differentiate between randomized controlled trials (RCTs) and quasi-experimental designs.
4. Implement Propensity Score Matching (PSM) to address selection bias.
5. Utilize Instrumental Variables (IV) for identifying causal relationships.
6. Apply the Difference-in-Differences (DiD) approach to observational data.
7. Design field experiments for evidence-based policy making.
8. Develop skills in counterfactual analysis and causal diagrams.
9. Integrate machine learning techniques with causal inference frameworks.
10. Enhance expertise in longitudinal data analysis for causal interpretation.
11. Apply natural experiments for real-world data analysis.
12. Translate experimental findings into policy recommendations.
13. Strengthen capacity for advanced statistical analysis in causal research.

Target Audience

1. Policy Analysts
2. Social Scientists & Researchers
3. Data Scientists & Statisticians
4. Development Practitioners
5. Monitoring & Evaluation Professionals
6. Academic Scholars & PhD Students
7. Business Analysts & Strategists
8. Public Health Researchers

Course Duration: 5 days

Course Modules

Module 1: Foundations of Experimental Design

- Key concepts and history of experimental research
- Types of experimental designs: pretest-posttest, factorial, crossover
- Randomization techniques and control groups
- Addressing internal and external validity
- Designing experiments in social sciences
- **Case Study:** Designing an RCT for an education intervention in rural schools

Module 2: Introduction to Causal Inference

- Understanding causality vs. correlation
- Causal diagrams and Directed Acyclic Graphs (DAGs)
- Counterfactual reasoning
- Identification strategies for causal relationships
- Common pitfalls in causal inference

- **Case Study:** Evaluating the impact of microfinance on household income

Module 3: Randomized Controlled Trials (RCTs)

- Principles of RCTs in policy research
- Sampling and random assignment
- Blinding and ethical considerations
- Managing attrition and compliance issues
- Analyzing RCT data with statistical rigor
- **Case Study:** Health intervention RCT on vaccination uptake

Module 4: Quasi-Experimental Designs

- When RCTs are not feasible: alternatives
- Propensity Score Matching (PSM)
- Regression Discontinuity Design (RDD)
- Instrumental Variables (IV)
- Ensuring validity in quasi-experiments
- **Case Study:** Impact of conditional cash transfers using PSM

Module 5: Advanced Statistical Techniques in Causal Inference

- Difference-in-Differences (DiD) analysis
- Fixed effects models in panel data
- Mediation and moderation analysis
- Sensitivity analysis
- Integrating ML algorithms for causal insights
- **Case Study:** Analyzing employment effects post-policy reform

Module 6: Designing Field Experiments

- Planning and logistics in field settings
- Ethical considerations in field experiments
- Piloting and scaling interventions
- Community engagement and stakeholder buy-in
- Data collection methodologies
- **Case Study:** Behavioral nudges to improve tax compliance

Module 7: Causal Inference with Observational Data

- Challenges in using non-experimental data
- Matching methods and weighting strategies
- Synthetic control methods
- Longitudinal and time-series analysis
- Using administrative data for causal research
- **Case Study:** Policy impact of minimum wage increase using DiD

Module 8: Translating Research into Policy

- Communicating findings to policymakers
- Visualization and presentation of causal results
- Crafting actionable recommendations
- Policy briefs and executive summaries
- Building evidence-based advocacy strategies
- **Case Study:** Informing urban transportation policy through experimental research

Training Methodology

- Interactive lectures with real-world examples
- Hands-on statistical analysis using R, STATA, and Python
- Group exercises and collaborative problem-solving
- Practical assignments with feedback
- Case studies analysis for contextual learning
- Simulation of field experiment designs
- Peer-to-peer learning and discussions
- Pre and post-training assessments

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

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$4,500
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