DATA SCIENTIST | Program Topics

The Data Scientist program curriculum covers the following topics:

Module 1 | Experiments
- Key concepts in data science and business analytics
- Experimental design and analysis
- Experimental analysis and testing
  - Potential outcomes and randomization/OVB (Omitted Variable Bias)
  - Balance, internal, and external validity
- Type I and Type II errors, power calculations, and sampling (errors)
- Compliance, attrition, and spillover
- Experimental design issues
  - Encouragement, cross random X, and multi-arm
  - Issues: clusters, stepped wedge, and exposure period
- Leadership development: problem solving for data science and experimental analysis in managerial decision making
- Cases and exercises
  - Methods to solve business problems
  - Interpreting experiments

Module 2 | Webinars

Module 3 | Casual Inference and Observational Data
- Challenge/OVB and data generation
- Matching/IPW (Inverse Probability Rating)
- IV (Instrumental Variables) - demand
- IV lotteries
- Process/DGP (Data Generation Process) and RD (Regression Discontinuity)
- Difference in difference/synthesize control
- Events studies
- Observation "experiments"
- Leadership development: case and exercise on memory, focus, and complex projects
- Exercise and discussion: making business decisions based on statistical research
- Group exercise: recognize, classify, and forecast

Module 4 | Webinars

Module 5 | Prediction and Forecasting

Visit the program page at: https://executive.berkeley.edu/programs/data-scientist
Leadership Action Plan
Machine learning
Machine learning meets casual inference
Communicating data-driven insights
Regression - model building
Business simulation: communicating data-driven insights to different stakeholders
Workshop: executing your business improvement
Engineering Leadership Action Plan
Leadership development
  - Managing efficiency for data science business projects
  - Leadership skills to succeed in the age of machine learning and digital disruption

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