

Data-Informed Economic Analysis

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Course Description:

We are surrounded daily by claims built on data: "raising the minimum wage destroys jobs," "immigration lowers local wages," "this tax cut paid for itself." But which of these claims deserve our trust – and how would we verify them?

This course teaches students to think with data, not merely compute with it. Students will learn where economic data actually comes from, how to recognize when it is incomplete, misleading, or simply wrong, and how to transform a raw, disorganized dataset into a sound foundation for analysis. Along the way, they will develop the habits of a careful empirical thinker: exploring patterns, creating honest and informative visualizations, understanding uncertainty, and – crucially – recognizing why correlation is not causation.

The course requires no advanced mathematics and no prior programming experience – only curiosity about how the economy really works and a willingness to engage with real data. Whether the next step is econometrics, policy analysis, journalism, or business, this course equips students with the judgment to ask the right questions of data before any modeling begins.

By the end of the course, students should be able to take an economic question, locate and prepare suitable data, explore it carefully, communicate findings clearly, and understand what further analysis would be needed before making stronger causal claims. The course is designed as a bridge between introductory statistics and later econometrics courses.

Course Prerequisites:

Introductory statistics is recommended.

Course Objectives/Learning Outcomes:

By the end of the course, students will be able to:

- ✓ Formulate economic questions that can be explored with data;
- ✓ Identify, access, and evaluate relevant data sources;
- ✓ Understand the difference between raw data, cleaned data, and analysis-ready data;

- ✓ Load, inspect, clean, and restructure datasets using statistical software;
- ✓ Work with missing values, duplicates, inconsistent variable definitions, and other common data problems;
- ✓ Combine datasets through merging, appending, and reshaping;
- ✓ Produce and interpret descriptive statistics;
- ✓ Use exploratory data analysis to identify patterns, anomalies, and limitations in data;
- ✓ Create clear and informative visualizations for economic data;
- ✓ Explain basic statistical concepts such as sampling, variation, uncertainty, confidence intervals, and hypothesis testing;
- ✓ Distinguish correlation from causation and identify common threats to causal interpretation;
- ✓ Communicate empirical findings in a clear, transparent, and reproducible way.

Grading Policy:

- In-class participation and attendance: 10%
- In-class quizzes: 2x10%
- Practical data assignment: 20%
- Presentation of the practical assignment: 10%
- Final exam: 40%

Mandatory Completion Policy

Note that all mandatory assignments and exams must be completed to the best of your ability in order for your final grade to be issued. Failure to complete a mandatory assignment or exam may result in a failing grade.

Letter Grade	Percentage	Description
A+	97-100	Excellent Work
A	93-97	Outstanding Work
A-	90-92	
B+	87-89	Good work
B	83-86	
B-	80-82	
C+	77-79	Acceptable Work
C	73-76	
C-	70-72	
D+	67-69	Work that is significantly below average
D	63-66	
D-	60-62	
F	0-59	Work that does not meet the minimum standards for passing the course

AEP Academic Integrity Policy

Plagiarism and other forms of academic dishonesty are not tolerated. The use of Artificial Intelligence (AI) for the development of knowledge and learning is encouraged at many stages of the learning process. While we value technology for educational purposes, we also value originality and the retainment of knowledge, and thus using AI for assignments and examinations, even if rephrased, is strictly prohibited and considered an academic integrity violation, unless the instructor explicitly allows for it in the context of evaluated work

AEP Non-Discrimination/Harassment Policy

The AEP program in Prague promotes a diverse learning environment where the dignity, worth, and differences of each individual are valued and respected. Discrimination and harassment, whether based on a person's race, gender, sexual orientation, color, religion, national origin, age, disability, or other legally protected characteristics, are repugnant and completely inconsistent with our objectives. Retaliation against individuals for raising good faith claims of harassment and/or discrimination is prohibited.

AEP Diversity Policy

AEP is committed to fostering an inclusive and welcoming community that values diversity in all its forms. We believe that one of the most meaningful lessons of studying abroad is learning to navigate and appreciate differences with curiosity and an open mind. While engaging across differences can sometimes be challenging or uncomfortable, these moments are essential for growth and learning. We recognize that every member of our community, even with the best intentions, may occasionally make missteps. Our commitment is to provide a supportive environment where respectful and honest dialogue helps us learn from these experiences, ensuring that every student has the opportunity to thrive and broaden their perspective.

Weekly Schedule

Week 1

CEE Introductory Lecture Series

AEP Introductory Lecture Series

Week 2

Class Topic

Introduction to Empirical Work in Economics and Course Orientation

- What does it mean to answer an economic question with data?
- The empirical workflow: question, data, cleaning, exploration, interpretation
- Course structure, logistics, and assignments

Week 3

Class Topic

Measurement in Economics

- Units of observation and levels of analysis
- Stocks, flows, rates, shares, indices, and monetary values
- Nominal versus real values and the importance of comparable units
- Measurement error and differences between concepts and available indicators

Week 4

Class Topic

Economic Questions and Data Sources

- Common sources of economic data: surveys, administrative data, open data portals, firm data, geographic data, and replication files
- Units of observation: individuals, households, firms, regions, countries, and time periods
- Cross-sectional, repeated cross-sectional, longitudinal, and aggregate data
- Coverage, non-response, attrition, and changes in definitions over time

Week 5

Class Topic

Preparing Source Data for Economics Analysis

- Assessing whether a dataset is suitable for a particular economic question
- Missing values, duplicates, outliers, inconsistent categories, and date formats
- Understanding identifiers, weights, derived variables, and dataset structure
- Renaming variables, recoding categories, and creating derived variables
- Combining and restructuring data

Week 6

Class Topic

Exploratory Data Analysis I: Describing Data

- Descriptive statistics: means, medians, percentiles, standard deviations, and proportions
- Group comparisons and summary tables
- Identifying unusual observations and patterns

Week 7

Class Topic

Exploratory Data Analysis II: Visualization

- Choosing the right graph for the question
- Distributions, comparisons, relationships, and changes over time
- Misleading graphs and common visualization mistakes

Week 8

Class Topic

Statistical Thinking I: Sampling, Variation, and Uncertainty

- Populations, samples, and sampling variation
- Standard errors and confidence intervals
- Why uncertainty matters when interpreting data

Week 9

Class Topic

Statistical Thinking II: Hypothesis Testing and Group Comparisons

- The logic of hypothesis testing
- Statistical significance and p-values
- Comparing means and proportions across groups
- Interpreting confidence intervals for group differences

Week 10

Class Topic

Statistical Thinking III: Relationships and Economic Importance

- Correlation and simple relationships between variables
- Direction, strength, and form of statistical relationships
- Statistical significance versus economic importance
- Communicating the magnitude and practical relevance of results

Week 12

Class Topic

Causal Thinking: From Association to Explanation

- Correlation versus causation
- The role of mechanisms in explaining observed relationships
- Confounding and omitted factors
- Selection into groups, programs, or observed samples
- Reverse causality and alternative explanations
- Introducing counterfactual thinking

Week 12

Class Topic

Interpreting Evidence and Course Synthesis

- What descriptive and statistical evidence can and cannot show
- Distinguishing findings from assumptions and interpretations
- Assessing the strength and limitations of empirical evidence
- Preparing data and research questions for later econometric analysis
- Course wrap-up and final project guidance

Week 13

Class Topic

Students Presentations of Practical Assignment

Recommended Readings:

- Diez, D., Barr, C., & Çetinkaya-Rundel, M. OpenIntro Statistics.
- Freedman, D., Pisani, R., & Purves, R. Statistics.
- Schwabish, J. Better Data Visualizations: A Guide for Scholars, Researchers, and Wonks.
- Salganik, M. Bit by Bit: Social Research in the Digital Age.
- Angrist, J. D., & Pischke, J.-S. Mastering 'Metrics: The Path from Cause to Effect. Introductory chapters only.
- Cunningham, S. Causal Inference: The Mixtape. Introductory chapters only.