

シラバス (様式)

授業科目名： Method and Application of Data Analysis			担当教員名： Kentaro Hirose
選択/必修： Elective	単位数： 2	セメスター： 1 Fall	開講言語： English
○授業の到達目標及びテーマ To learn how to think scientifically through data analysis.			
○授業の概要 Data analysis is becoming increasingly important in various disciplines such as political science, economics, sociology, psychology, and even history and literature. In this course, students will learn how to think scientifically through data analysis. To motivate students, the course will introduce a lot of real examples of data analysis conducted in political science, especially international relations (which is my expertise). Does the balance of power actually bring international peace? Did nuclear weapons really change international politics? Is economic interdependence really good for maintaining peace? Do peacekeeping operations really keep peace, or are they just sent to safe places? Does ethnic heterogeneity really increase the likelihood of civil war? Is democracy the only political system conducive to domestic peace? Using these real examples of political science, students will learn how to analyze raw data, basic rules for regression analysis, and some useful modeling techniques. We will use R, one of the most widely used statistical packages, throughout the course.			
○授業の方法 Students will do data analysis in class or as homework after each lecture.			
○授業計画			
1. Introduction			
2. Does the Balance of Power Actually Bring Peace?			
— Measuring abstract concepts such as power and war			
— Measurement error in the independent variable			
— Measurement error in the dependent variable			
— Unit of analysis			
3. Basics of Causal Inference			
— Correlation and causation			
— Case selection based on the dependent variable			
— Omitted variable bias			
— Reverse causality			
— Experiments and quasi-experiments			
4-5. Basics of R Programming			
— Arithmetic operations			
— Vector, matrix, list, factor, character			
— Missing data			

- Histogram, cross tabulation, scatter plot, box plot, bubble plot
- Functions, for loops, if statements
- Importing and exporting data
- Merging data

6-7. Linear Model

8. Logit Model

9. Some Useful Modeling Techniques

- Interaction term
- Higher order term
- Log transformation

10-11. Statistical Uncertainty

- Standard error
- Confidence interval

12. Panel Data

- Fixed effect
- Clustered standard error

13. Other Practical Issues

- Post-treatment bias
- Overfitting
- Interpretation of statistical (in)significance

14. How to Make a Good Presentation

- Good tables and bad tables
- Good figures and bad figures

15. Student Presentation

○テキスト

I will post slides and notes online.

○参考書・参考資料等

For causal inference:

- Gary King, Robert O. Keohane, and Sidney Verba, *Designing Social Inquiry*.

For data analysis with R:

- Kosuke Imai, *Quantitative Social Science: An Introduction*.

For regression models:

- Jeffrey M. Wooldridge, *Introductory Econometrics*.

○学生に対する評価

Homework (80%)

Presentation (20%)

○警戒レベル3以上の場合の授業形態について

Class format : Online class (Real-time delivery)

Location of class materials, notices, and correspondence information: manaba folio