

MGCS 5012
MGCS 5012: Quantitative Data Analysis

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Course Description

This course introduces quantitative data analysis in a broader scope, covering a wide variety of data types and analytical strategies. It first reviews conventional sources of quantitative data used by social scientists, such as census and survey, followed by a suit of sessions on practical issues involved in analyzing such data. The second part of the course introduces unconventional data types, including social networks, non-structured texts, and “big data”, which has gained tremendous popularity across various fields. Methodological and analytical challenges posed by unconventional data will be discussed. This course also features a devoted session on visualization, which is involved in nearly all data analysis. Students are expected to have a deeper understanding of data analysis after completing this course.

Class Schedule

NO.	THEME
L1	Course Overview
L2	Conventional Data Types
L3	Conventional Data Management
L4	Regression Framework
L5	More on Survey Data Analysis
L6	<i>Student Presentation</i>
L7	SNA
L8	Text Analytics & NLP
L9	Big Data
L10	<i>Student Presentation</i>
L11	Visualization
L12-13	<i>Presentation on Project</i>

Assessment:

Participation (30%): Attendance (10%) and in-class presentations (20%).
Project (70%): Oral presentation (20%) and written report (50%)

Prerequisite:

Basic knowledge about statistics and data analysis

References:

- [B] Babbie, Earl. 2013. *The Practice of Social Research*. (13th Ed.). Wadsworth Publishing.
- [L] Lohr, Sharon. 2009. *Sampling: Design and Analysis*. (2nd Ed.). Duxbury Press.
- [F] Fox, John, 2008. *Applied Regression Analysis and Generalized Linear Models* (2nd Ed.). SAGE Publications, Inc.
- [IR] Imbens, Guido W., and Donald B. Rubin. 2015. *Causal Inference for Statistics, Social, and Biomedical Sciences: An Introduction*. Cambridge University Press.
- [MET] Miner, Gary, et al. 2012. *Practical Text Mining and Statistical Analysis for Non-structured Text Data Applications*. Academic Press.