

UFUG1811 (L01) - Quantitative Data Analysis for Social Research

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Syllabus - UFUG 1811: Quantitative Data Analysis for Social Research

Spring, 2026

Monday, 6:00-8:50 pm (Lecture)

Tuesday, 6:00-6:50 pm (Tutorial)

Location: E1-227

No. of Credits: 3

Pre-/co-requisites: None

Instructor: Dr. Chaosu Li (chaosuli@hkust-gz.edu.cn)

Office: E2-609

Office Hours: 2:00 PM – 5:00PM, Tuesdays (or by appointment)

TA: Wenchao Li



Course Description:

The goal of this course is to introduce students to data analysis methods and procedures commonly used in social sciences. During the course, students will acquire practical skills to be able to gather, generate, visualize and analyze quantitative data in social science research.

Intended Learning Outcomes (ILOs)

By the end of this course, students should be able to:

1. Articulate how quantitative methods are typically used to produce research evidence in social sciences disciplines,
2. Read and understand most academic social sciences articles that use quantitative approaches,
3. Choose statistical methods appropriate to their data and substantive research problem,
4. Design a quantitative social study.

Assessment and Grading

This course will be assessed using criterion-referencing and grades will not be assigned using a curve. Detailed rubrics for each assignment are provided below, outlining the criteria used for evaluation. The assessments of the course will be composed of four parts:

Course participation 10%

Project report 20%

Presentation 10%

Final exam 60%

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
Course participation	ILO1, ILO2, ILO3, ILO4	This task assesses students' ability to engage with and apply quantitative methods (ILO 1), understand and discuss academic articles (ILO 2), select appropriate statistical methods (ILO 3), and contribute to the design and implementation of a quantitative study (ILO 4). Active participation in class discussions, practical exercises, and peer collaboration will be evaluated.
Project report	ILO3, ILO4	The project report assesses students' ability to choose and justify statistical methods appropriate to their data and research problem (ILO 3). It also evaluates their competence in designing and executing a quantitative social study, demonstrating their understanding of research design, data analysis, and interpretation (ILO 4).
Presentation	ILO3, ILO4	The presentation assesses students' ability to effectively communicate their chosen statistical methods and research design (ILO 3). It also evaluates their ability to present and defend their quantitative social study, demonstrating clear articulation of their research process and findings (ILO 4).
Final exam	ILO1, ILO2, ILO3, ILO4	The final exam assesses students' overall understanding of how quantitative methods are used in social sciences (ILO 1), their ability to comprehend and analyze academic articles (ILO 2), their skill in selecting appropriate statistical methods for various research problems (ILO 3), and their ability to design a well-structured quantitative social study (ILO 4).

Grading Rubrics

Project Report Grading Rubric

Criteria	Excellent	Good	Satisfactory	Needs Improvement	Unacceptable
Clarity of Research Question	Research question is clear, focused, and highly relevant.	Research question is clear and relevant, but may be slightly broad.	Research question is present but somewhat unclear or too broad.	Research question is unclear or not fully relevant.	No clear research question.
Appropriateness of Methods	Statistical methods are well-chosen and applied correctly.	Methods are appropriate with minor errors in application.	Methods are generally appropriate but with some significant errors.	Methods are not appropriate or incorrectly applied.	Methods are missing or entirely incorrect.
Data Analysis	Analysis is accurate and well-documented, with clear interpretation.	Analysis is mostly accurate with minor errors, adequately documented.	Analysis is somewhat accurate but with notable errors or unclear documentation.	Analysis is incomplete, with significant errors or poor documentation.	Analysis is incorrect or missing.
Presentation of Results	Results are presented	Results are clear but	Results are presented but	Results presentation is	Results are not

	clearly, with well-designed tables/graphs.	tables/graphs may have minor issues.	may be unclear or poorly designed.	unclear, with poorly designed visuals.	presented or are entirely unclear.
Writing & Organization	Report is well-organized and clearly written, with few errors.	Report is organized with minor writing errors.	Report has some organizational issues and writing errors.	Report is poorly organized with significant writing errors.	Report is disorganized and difficult to understand.

Presentation Grading Rubric

Criteria	Excellent	Good	Satisfactory	Needs Improvement	Unacceptable
Content & Organization	Content is clear, well-organized, and logically structured.	Content is clear and organized, but may have minor issues in flow.	Content is mostly clear, but organization may be somewhat disjointed.	Content is unclear or poorly organized, making it difficult to follow.	Content is unclear, disorganized, and difficult to follow.
Clarity & Communication	Ideas are communicated clearly and confidently, engaging the audience.	Ideas are communicated clearly, with good audience engagement.	Communication is mostly clear, but may lack confidence or engagement.	Communication lacks clarity, with minimal audience engagement.	Communication is unclear and fails to engage the audience.
Use of Visual Aids	Visual aids are clear, well-designed, and effectively enhance the presentation.	Visual aids are clear and support the presentation well.	Visual aids are used but may not fully enhance the presentation.	Visual aids are unclear or poorly designed, detracting from the presentation.	Visual aids are missing or entirely ineffective.
Understanding of Topic	Demonstrates strong understanding of the topic, through insightful explanations and clear connections between ideas.	Demonstrates good understanding, with clear explanations and connections between ideas.	Shows basic understanding, with some clear explanations but limited depth or connections.	Shows limited understanding, with explanations that are unclear or lack depth.	Lacks understanding of the topic, with explanations that are incorrect or missing.

Final Grade Descriptors

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance	Demonstrates strong understanding and effective application of quantitative methods. Clearly articulates the role of quantitative methods in social sciences with depth and accuracy. Shows a solid ability to understand and explain quantitative approaches

		used in academic articles. Selects appropriate statistical methods and applies them correctly using R, with well-documented processes and results. Designs clear and methodologically sound studies, addressing research questions effectively.
B	Good Performance	Shows a good understanding of quantitative methods and their application. Explains the role of quantitative methods in social sciences accurately, with a good grasp of fundamental concepts. Understands and can discuss the quantitative methods used in academic articles, with minor errors or gaps. Selects and applies appropriate statistical methods, with some minor mistakes in execution or interpretation. Designs studies that are methodologically sound and address the research questions, though with some areas for improvement.
C	Satisfactory Performance	Demonstrates a basic understanding of quantitative methods. Articulates the basic concepts of quantitative methods in social sciences, though with some gaps in understanding. Understands the main points of quantitative methods in academic articles but may struggle with more complex aspects. Applies statistical methods that are generally appropriate but may have some errors or lack depth. Designs studies that are adequate but may have methodological weaknesses or be too simplistic.
D	Marginal Pass	Shows minimal understanding of quantitative methods. Demonstrates basic understanding but with significant gaps or errors. Struggles to understand and interpret quantitative methods in academic articles, with limited ability to apply them. Often applies statistical methods incorrectly or inappropriately. Designs studies with major methodological flaws or insufficient depth, failing to adequately address the research question.
F	Fail	Demonstrates insufficient understanding of quantitative methods. Fails to understand core concepts of quantitative methods. Cannot effectively interpret academic articles or apply statistical methods. Fails to design coherent or methodologically sound studies.

Course AI Policy

In this course, students are allowed to use generative artificial intelligence (genAI) to aid you in any manner except the final examination. However, you must cite the AI generated contents and provide the prompt you used and corresponding AI generated contents.

Communication and Feedback Assessment marks for individual assessed tasks will typically be communicated within two weeks of submission. Feedback on assignments will include specific details such as strengths and areas for improvement. Students with further questions about the feedback including marks should consult the instructor within five working days after receiving the feedback.

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Late Submission Policy

Late submission is allowed. However, any late submission will receive a 20% deduction per day late.

Required Texts and Materials

(Available online through Library) Agresti, A., Franklin, C., & Klingenberg, B. (2023). *Statistics : the Art and Science of Learning from Data, Global Edition (Fifth edition.)*. Pearson Education Limited.

(Available online through Library) Stockemer, D., & Bordeleau, J.-N. (2023). *Quantitative Methods for the Social Sciences : A Practical Introduction with Examples in R (Second edition.)*. Springer.

<https://doi.org/10.1007/978-3-031-34583-8> ↗ (<https://doi.org/10.1007/978-3-031-34583-8>)

Fogarty, B. J. (2023). *Quantitative social science data with R: an introduction*.

(Optional) Salganik, M. J. (2018). *Bit by bit: social research in the digital age*. Princeton University Press.

Required Software

R will be used throughout the course. *Don't worry if you do not have any prior experience in programming*. We will walk you through basic R skills necessary in this course.

Schedule (subject to adjustment)

Week 1(Jan 26): Introduction to quantitative data analysis in social science

Week 2(Feb 2): Research Questions & Hypotheses, Measurement

Week 3(Feb 9): Sampling Frame & Research Design, Research Quality

Week 4(Feb 28): Survey Design; Introduction to Experimental Design

Week 5(March 2): Summarizing Data; Use and Misuse of Descriptive Statistics

Week 6(March 9): Probability; Probability Distributions; Sampling Distribution

Week 7(March 16): Confidence Intervals & Significance Tests

Week 8(March 23): Comparing 2 Groups/T-test

Week 9(March 30): Understanding Correlation and Bivariate Measures of Association

Week 10(April 13): Bivariate Regression

Week 11(April 20): Multivariate Regression

Week 12(April 27): Introduction to Data Science and Big Data in Social Research; Introduction to Large Language Model in Social Research

Week 13 (May 11): Final Project Presentation and Wrap-up

Week 14: Final Exam (Time to be determined)

Week	Topics	Related ILOs
Week 1	Introduction to Quantitative Data Analysis in Social Science Getting started with R [T]	ILO1, ILO2
Week 2	Research Questions & Hypotheses, Measurement Variables and Manipulation [T]	ILO1, ILO2, ILO4
Week 3	Sampling & Research Design, Research Quality Developing Hypotheses [T]	ILO1, ILO2, ILO4
Week 4	Survey Design; Introduction to Experimental Design Survey Design Workshop [T]	ILO1, ILO2, ILO4
Week 5	Summarizing Data; Descriptive Statistics Descriptive Statistics [T]	ILO1, ILO2, ILO3

Week 6	Probability; Probability Distributions; Sampling Distribution Visualizing Data [T]	ILO1, ILO2, ILO3
Week 7	Confidence Intervals & Significance Tests Sampling Distribution/Confidence Intervals [T]	ILO1, ILO2, ILO3
Week 8	Comparing 2 Groups/T-test T-test [T]	ILO1, ILO2, ILO3
Week 9	Understanding Correlation and Bivariate Measures of Association Bivariate Analysis [T]	ILO1, ILO2, ILO3
Week 10	Bivariate Regression Bivariate Linear Regression [T]	ILO1, ILO2, ILO3
Week 11	Multivariate Regression Multiple Regression and Model Building [T]	ILO1, ILO2, ILO3
Week 12	Introduction to Data Science and Big Data in Social Research; Introduction to Large Language Model in Social Research Using ChatGPT API and R for Social Science Research [T]	ILO1, ILO2, ILO3
Week 13	Final Project Presentation and Wrap-up	ILO1, ILO2, ILO3, ILO4
Week 14	Final Exam	ILO1, ILO2, ILO3, ILO4

Academic Integrity

Students are expected to adhere to the University's academic integrity policy and to uphold HKUST (Guangzhou)'s Academic Honor Code, maintaining the highest standards of academic integrity. The University has zero tolerance for academic misconduct.

Students should refer to the Regulations for Academic Integrity and Student Conduct for the University's definition of plagiarism and guidance on how to avoid cheating and plagiarism.\

Course Summary:

Date	Details	Due
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