The Hong Kong University of Science and Technology
SOSC 3730 – Survey Design and Methods

Survey Design and Methods
SOSC 3730
3 Credits
Prerequisite(s): SOSC 2400 OR MATH 2411 OR MATH 2421

Professor KANG Suji
Email: sujikang@ust.hk
Class: Tuesday and Thursday 12:00-1:20pm
Office Hours: Tuesday 2:00-3:00pm or by appointment at Room 3338

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Course Description

This course offers systematic training in survey design and methodology—a cornerstone of modern social science research. Students will learn how to develop and conduct rigorous surveys, covering topics such as questionnaire construction, sampling techniques, ethical review, survey experiments, and data analysis. The course also covers advanced statistical topics including weighting to correct for sampling and nonresponse bias, and causal inference and post-treatment bias through survey experiments. Emphasis will be placed on both conceptual foundations and practical implementation using R. The course culminates in a hands-on survey project.

Intended Learning Outcomes (ILOs)

On successful completion of the course, students will be able to:

1. Design and implement a complete survey research project, including question development, sampling strategy, data collection, and ethical review procedures.
2. Construct valid and reliable survey instruments, taking into account measurement error, social desirability bias, and techniques for eliciting sincere responses.
3. Apply advanced statistical techniques—such as weighting methods, power analysis, and adjustment for sampling/nonresponse bias—to analyze survey data appropriately.
4. Integrate causal inference principles and experimental design into surveys, with a focus on identifying and mitigating post-treatment bias.
5. Use R for data processing, statistical analysis, and visualization, developing computational skills relevant to both academic and industry research settings.
6. Critically evaluate survey-based research by assessing methodological rigor, validity of findings, and implications of design choices.
7. Effectively communicate survey research findings through written reports, visualizations, and oral presentations tailored to both academic and non-academic audiences.

Assessment and Grading
This course will be assessed using criterion-referencing and grades will not be assigned using a curve. Details are provided below.

Assessments:

Assessment Task	Contribution to Overall Course grade (%)	Date/due date
In-class exam 1	15%	March 5
In-class exam 2	15%	April 9
Two take-home assignments	20%	To be announced in class/via Canvas
Final Team Project Paper	25%	May 19
Final Team Presentation	10%	May 5 or 7
Participation	10%	
Attendance	5%	

Grading Policy
Your final grade will be based on the following:

- Take-home assignments (20%): Details about the two take-home assignments will be announced during the class/via Canvas.
- In-class exam 1 (15%) & In-class exam 2 (15%): The exams will be no longer than one hour and be a mix of multiple choice and short answers.
- Final team project paper (25%): Students will work in teams to produce a complete research paper using publicly available survey datasets. This component assesses students' ability to design and execute a survey research project, including manipulating survey datasets, data analysis, and interpretation. Evaluation emphasizes methodological rigor, analytical accuracy, and clarity of written communication.
- Final team presentation (10%): Teams will present their projects at the end of the semester. Presentations should clearly communicate the research question, hypotheses, data sources, and key findings using effective visualizations. Students will also be evaluated on their ability to respond thoughtfully and clearly to questions during the Q&A.
- Participation (10%): Students are expected to attend all classes and actively participate. At a minimum, this includes remaining attentive during class (e.g., refraining from using digital devices for non-course purposes), coming prepared to discuss assigned readings or materials, and engaging constructively in class activities and discussions. Participation is evaluated based on both the quality of engagement and the quantity of contributions.
- Attendance (5%)

Submission of Assignments and Final Team Project Paper
All assignments and final team project papers must be submitted electronically through Canvas by the stated deadline (11:59pm). Assignments submitted via email will not be accepted.

Late Work Policy

Late assignments will not be accepted. Exceptions will be granted only in cases of documented illness, verified by a note from a health care provider. Assignments submitted late without an approved excuse will receive a score of zero. Please do not request extensions without a legitimate and documented reason.

Grade Review Policy

Requests for grade reviews must be submitted within one week of the grade being released. Appeals must include a *written* explanation outlining the basis for the request and must be accompanied by a hard copy of the original assignment. A grade review might lead to a lower grade being assigned. Appeals submitted after the deadline or without the required materials will not be considered.

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
Take-home assignments	ILO-2, ILO-3, ILO-4, ILO-5, ILO-6	Assess students' ability to design survey measures, apply statistical techniques, analyze data using R, and evaluate methodological limitations and sources of bias.
In-class exams	ILO-2, ILO-4, ILO-6	Assess conceptual understanding of survey measurement, survey design, errors in surveys, and critical evaluation of survey-based evidence.
Final team project paper	ILO-1, ILO-2, ILO-3, ILO-4, ILO-5, ILO-7	Assess students' ability to design and implement a complete survey project, apply statistical and computational methods, integrate causal reasoning, and communicate findings in a professional written report.
Final team presentation	ILO-7	Assess students' ability to clearly and effectively communicate research design, results, and implications using appropriate visualizations and explanations, and to demonstrate understanding and critical thinking through responses during the Q&A.

Course AI Policy

The use of artificial intelligence (AI) tools is mostly only relevant to the research paper component of this course. Students are strongly discouraged from using AI, except in a limited capacity such as basic proofreading. AI tools are not a reliable substitute for reading and engaging with the academic literature related to your project and frequently produce inaccurate or fabricated citations and summaries. Submissions that misrepresent or inaccurately describe the relevant literature will receive a very poor grade. Please note that the instructor and teaching assistants are familiar with the literature in this field.

Readings

All *assigned* readings can be found via Canvas. Some of the readings may be changed as the course progresses. Changes will be announced in class or via Canvas.

Recommended Book

Groves, R.M., Fowler, F.J., Couper, M.P., Lepkowski, J.M., Singer, E. and Tourangeau, R., 2004. *Survey methodology*. Second Edition.

Software

This course uses R, an open-source statistical programming language widely used in both academia and industry for data analysis and visualization. Students can download R and access documentation at http://www.r-project.org/. To facilitate ease of use, students are strongly encouraged to install RStudio (https://posit.co/downloads/), a free integrated development environment that simplifies coding and workflow management.

Academic Integrity

Students are expected to adhere to the university's academic integrity policy. Students are expected to uphold HKUST's Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to Academic Integrity | HKUST – Academic Registry for the University's definition of plagiarism and ways to avoid cheating and plagiarism.