

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

Students who have not taken the listed prerequisites but have taken SOSC 1100 should request instructor approval.

Professor KANG Suji

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Class: Wednesday and Friday 15:00-16:20pm

Office Hours: Wednesday 16:30-17:30pm or by appointment at Room 3338

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	20%	September 25
In-class exam 2	20%	October 30
Two take-home assignments	10%	To be announced in class/via Canvas
Final Team Project Paper	25%	December 10
Final Team Presentation	10%	November 25 or 27
Participation	10%	
Attendance	5%	

Grading Policy

Your final grade will be based on the following:

- Take-home assignments (10%): Details about the two take-home assignments will be announced during the class/via Canvas.
- In-class exam 1 (20%) & In-class exam 2 (20%): 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. In addition, we will have some in-class exercises, and submitting your work in class will count towards participation.
- Attendance (5%): Friday morning tutorial sessions are optional and will not count toward your attendance grade.

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.

Lecture Slides

All lecture slides and materials used in class will be uploaded to Canvas.

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.

Tentative Course Schedule

There may be some changes to topics and readings. The changes will be announced via Canvas/in class.

Week	Date	Topic	Reading
1	Sep 2	Introduction, course syllabus, in-take survey	
1	Sep 4	Research design and validity	Druckman. Pages 27-40, 61-70.
2	Sep 9	Types of errors in surveys	Groves et al. chap. 2.1-2.3
2	Sep 11	Sampling frames / Assignment 1	Fowler. chap 3
4	Sep 16	Unit and Item Nonresponse and Non-probability Sampling	Groves et al. chapter 6.
4	Sep 18	Opt-in online samples and Hard-to-Survey Populations	Bohannon, John. 2016. "Mechanical Turk Upends Social Sciences." <i>Science</i> 352; 1263-1264.

			Tourangeau, Roger. 2014. "Defining Hard-to-Survey Populations."
5	Sep 23	Ethics, IRB, and Pre-registration	Groves et al. chapter 11.
5	Sep 25	Exam 1	
6	Sep 30	Questionnaire Design: Wording, Order, and Format	Fowler chap 6.
6	Oct 2	Social Desirability Bias and Sincere Response Techniques; build your own survey using Qualtrics	Bullock, John G., et al. "Partisan bias in factual beliefs about politics." <i>Quarterly Journal of Political Science</i> 10.4 (2015): 519-578. Berinsky, A.J., 2018. Telling the truth about believing the lies? Evidence for the limited prevalence of expressive survey responding. <i>The Journal of Politics</i> , 80(1), pp.211-224.
7	Oct 7	R: in-class R exercises with survey dataset	
7	Oct 9	Weighting and Adjusting for Nonresponse / Assignment 2	Groves et al. 10.5 Druckman, James N., et al. "Correcting misperceptions of out-partisans decreases American legislators' support for undemocratic practices." <i>Proceedings of the National Academy of Sciences</i> 120.23 (2023): e2301836120.
8	Oct 14	Survey Experiments 1: Causal Inference & Post-treatment Bias (theory & concepts)	Schachter, Ariela, and Katherine Weisshaar. 2025. "Survey Experiments in Sociology." <i>Annual Review of Sociology</i> 51: 149-169. Druckman, J. N. (2001). On the limits of framing effects: Who can frame?. <i>The journal of politics</i> , 63(4), 1041-1066.
8	Oct 16	Survey Experiments 2: Causal Inference & Post-treatment Bias	Montgomery et al. 2018. How conditioning on posttreatment variables can ruin your experiment and what to do about it. <i>American Journal of Political Science</i> , 62(3), 760-775. Nyhan, B., & Reifler, J. (2010). When corrections fail: The persistence of political misperceptions. <i>Political Behavior</i> , 32(2), 303-330.
9	Oct 21	Conjoint Experiment	Bansak et al. 2021. "Conjoint Survey Experiments." In James N. Druckman and Donald P. Green, eds., <i>Advances in Experimental Political Science</i> . New York: Cambridge University Press.
9	Oct 23	R /Qualtrics: build your own Qualtrics survey with randomization	
10	Oct 28	Topic to be announced	
10	Oct 30	Exam 2	
11	Nov 4	Project Meetings 1	
11	Nov 6	Project Meetings 2/ Survey Data Cleaning & Descriptive Analysis	
12	Nov 11	Survey Data Cleaning & Descriptive Analysis Regressions with Survey Data	

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12	Nov 13	Survey Results Visualization with R	
13	Nov 18	Example survey experiment research	
13	Nov 20	Class review; AI in Survey Research; team exercises	
14	Nov 25	Final Team Presentation – Group 1	
14	Nov 27	Final Team Presentation – Group 2	
15	Dec 2	No Class (Study Break)	
15	Dec 4	No Class (Study Break)	
16	Dec 10	Final Team Paper Submission	