



STA 304 Surveys, Sampling and Observational Data

Winter 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email: TBA

COURSE OBJECTIVES

This course introduces students with statistical methods and data analysis from the perspective of surveys, sampling and observational data. Topics covered in this course include designing a survey, observational surveys, sampling design, estimation of mean and variances, unequal probability sampling strategies, stratified, proportional, post-stratified, multi-stage sampling, cluster sampling, errors and bias, covariance and correlation, simple random, examples and complete theoretical development, analysis of data using statistical software packages and etc. Specific topics include how to design surveys, design samples, collect and observe data.

Upon completion of this course, students will be able to:

1. Understand the basic concepts of surveys, sampling and observational data;
2. Design a survey or sample by observing and analyzing the data;
3. Carry out a variety of statistical analysis to make inference of different sampling surveys;
4. Identify and implement different sampling techniques and different study designs.

PREREQUISITES

STA 201 Introduction to Statistics

GRADING

Grades will be determined by accumulating points, with 100 points being the maximum, as follows:



ITEM	POINTS
Assignments	20 Points
Quizzes	20 Points
Midterm Exam	25 Points
Final Exam	35 Points
Total	100 Points

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F$.

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

Chaudhuri, Arijit, *Modern Survey Sampling*, CRC Press, 2014.

Recommended (Optional) Texts or Other Materials:

Peter Stopher, Collecting, *Managing, and Assessing Data Using Sample Surveys*, Cambridge University Press, 2012.

COURSE TOPICS

MODULE	TASKS
Module 1	Topics: Topic 1: Concepts of Population, Sample, and Sampling Topic 2: Designing a Survey Topic 3: Compound Survey Methods Topic 4: Observational Surveys Assessments: Quiz#1
Module 2	Topics: Topic 5: Random Responses; Simple Random Topic 6: Sampling Design, Sampling Scheme Topic 7: Estimation of Mean, Total, Ratio of Totals/Means: Variance and Variance Estimation Topic 8: Determination of Sample Sizes



	Assessments: Quiz#2
Module 3	Topics: Topic 9: More on Equal Probability Sampling Topic 10: Unequal Probability Sampling Strategies Topic 11: Multi-Stage Sampling; Proportional Sampling Topic 12: Stratified Sampling; Post-stratified Sampling Assessments: Assignment#1 Midterm
Module 4	Topics: Topic 13: Cluster Sampling Topic 14: Inferences Topic 15: Estimating Population Statistics and Sampling Errors Topic 16: Errors and Bias; Sample Errors Assessments: Assignment#2
Module 5	Topics: Topic 17: Missing Value Statistic; Coverage Error Topic 18: Data on Incomplete Responses; Examples and complete theoretical development Topic 19: Covariance and Correlation Topic 20: Deviations Needed for Covariance and Correlation Estimates; Analysis of data using statistical software packages Assessments: Final Exam

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.

Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed



the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

LEARNING REQUIREMENTS

- 1) Late assignments are not acceptable and are subjected to grade deductions.
- 2) Assignments submitted in the wrong format will be counted as not submitted.
- 3) Failure to submit or fulfill any required course component results in failure of the class.
- 4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
- 5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACADEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for



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access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.