



THE OHIO STATE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES

Statistics 6510: Survey Sampling Methods

Fall 2020

Instructor: Dr. Elizabeth A. Stasny, 319 Cockins Hall, 614-292-0784, stasny.1@osu.edu

Zoom Office Hours (Stasny): 2:30 – 3:30 Tuesday and immediately following each class.

Course Assistant: Mr. Dalton Hopper, hopper.129@osu.edu

Zoom Office Hours (Hopper): 11:30 – 12:30 Thursday

Textbook: Lohr, Sharon L., "Sampling: Design and Analysis", Chapman and Hall/CRC; 2019. (This is a reprinting of the 2nd edition published by Brooks/Cole; 2010.) The unlimited user ebook is available at <https://library.ohio-state.edu/record=b8944076~S7>.

Other Sampling References:

Cochran, Sampling Techniques

Schaeffer, Mendenhall, and Ott, Elementary Survey Sampling

Kish, Survey Sampling

Hanson, Hurwitz, and Madow, Sample Survey Methods and Theory, Vols. I and II

Groves, Fowler, Couper, et al., Survey Methodology

Prerequisites: A good background in the material covered in Statistics 5301 or Public Health Biostatistics 6212. Students should be knowledgeable about and comfortable with discrete data distributions, expected values, variances, confidence intervals, and regression. Many of these topics are reviewed in Appendix A of the course textbook.

Course Requirements: You are responsible for all material covered in class, in assigned readings, and on homework assignments. You are expected to attend all classes*. **Attendance is mandatory* for all class meetings at which students make presentations.** Reflection papers will be assigned after class group discussions and student presentations.

Course delivery

Classes will be delivered live using CarmenZoom lectures from 3:00-4:20 MW as scheduled. On occasion, the class will be divided into breakout rooms for group discussions.

Video and audio recordings of class lectures will be made during each class in case a student is ill and cannot attend. The video and audio recording will be used for educational purposes only and may be made available to any student presently enrolled in the course.

Computing: I plan to use the Statistical package R for my computing needs in the course. R is freely available for most operating systems (<http://www.r-project.org/>). If you are not already familiar with R, there are online tutorials available. I recommend getting started with swirl. This site <http://swirlstats.com/students.html> has instructions for downloading R, RShiny, and opening the swirl tutorial system. Once inside, you can learn the basics of working with R via the tutorial "R Programming: The basics of programming in R."

You may use any statistical package you prefer in this course; I may not be able to help you with the package you choose, however.

Homework: Assignments will be due approximately weekly. It is your job to ensure that your homework is easy to grade. Any computer output must be edited and annotated; graphs and plots must be clearly labeled and discussed in the text of the homework. Problems that are out of order or with parts not clearly identified may not receive full credit.

Additionally, reflection papers of 250-300 words will be due the class period after the 2-3 classes in which we have group discussions and after class presentations for which you are not a presenter. These will count as homework assignments for determining course grades. **No late assignments of any type will be accepted***.

Although you certainly may discuss homework with others outside of class, your submissions must be your own and should demonstrate your personal understanding of the problems.

Midterm: On or about Wednesday, October 21. The exam will be online and you may take up to two hours to complete and submit the exam. Start time will be as early as 2:30 p.m. and end time will be as late as 5:00 p.m. You may use your book and/or your notes, but the work you submit must be your own. There will be a practice the week prior to make sure that everyone is able to download the exam and submit it.

Ohio State's academic integrity policy

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

Class Presentations: Instead of a written final exam, each student will be required to make a 12-15-minute class presentation on an appropriate paper, report, or other similar document. I will provide a list of suggested papers on Carmen but students may suggest other papers or topics. The topics include Political Polling, the Decennial Census, Survey Biases, Questionnaire Design, Cognitive Aspects of Surveying, Web-based Surveys, and Complex Surveys. Requirements for presentations will be covered as the class progresses. Presentation topics must be decided by the end of September.

The following dates are reserved for class presentations (**attendance is required***). I will assign students to a date based on the topic of papers they choose:

- October 28 (Political Polling since this is the week before the election)
- November 9
- November 16
- November 23
- November 30
- December 7 (During the Final Exam time of 12:00-1:45)

* Obviously, if you are ill or caring for someone who is ill, we will make alternate arrangements. Please contact me by email as soon as possible and keep me apprised of your situation.

Grades: The final numerical grade will be determined as follows:

Homework (lowest grade dropped)	24%
Midterm Exam	33%
Class Presentation	33%
Class Participation	10%

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu.

Accessibility accommodations for students with disabilities

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; 098 Baker Hall, 113 W. 12th Avenue.

Your mental health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you, or someone you know, are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614- 292-5766. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273- TALK or at suicidepreventionlifeline.org.

Tentative Schedule of Topics

Introduction to sampling and its history	2 classes
Simple Random Sampling	3 classes
Estimating population means, proportions and totals	
Variances and Interval estimates	
Sample Size Determination	
Stratified Sampling	3 classes
Estimating population means, proportions and totals	
Variances and Interval estimates	
Designing good strata	
Sample size and sample allocation	
Sample-based weights	
Estimating a Ratio and Ratio Estimation	2 classes
Estimating population means, proportions and totals	
Variances and Interval estimates	
Cluster Sampling	4 classes
Estimating population means, proportions and totals	
Variances and Interval estimates	
Good versus practical clustering	
Single-stage, equal and unequal cluster sizes	
Two-stage cluster sampling	
Sample-based weights	
Probability Proportional to Size Sampling	1 class
Introduction to Questionnaire Design and Question Writing	2 classes
Nonsampling Errors	3 classes
Frame Design and Error	
Response Bias	
Nonresponse	
Other sources of error	
Ranked Set Sampling	1 class