Statistics 6510: Survey Sampling Methods   **Fall 2018**

Instructor: Dr. Elizabeth A. Stasny, 319 Cockins Hall, 292-0784, eas@stat.ohio-state.edu
    Office Hours (Stasny): 2:30 – 3:30 p.m. Tuesday and by prior appointment.

Course Assistant: Ms. Jordan Vasko, vasko.30@buckeyemail.osu.edu

    Office Hours (Vasko): 12:40 – 1:40 p.m. Friday in 134 Cockins Hall.

Textbook: Lohr, Sharon L., "Sampling: Design and Analysis", 2nd edition. Brooks/Cole; 2010.
You can purchase the text in hard copy, or as an e-book. The textbook on the publisher's website
is: https://www.cengage.com/c/sampling-design-and-analysis-2e-lohr. It is also available on two-
hour reserve at the 18th Ave. Library.

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.

Computing: I plan to use the Statistical package R for the 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."

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.

Homework: Assignments will be due approximately weekly at the start of the class period. It is
your job to make your homework 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.

<u>Midterm</u>: In class, on or about October 24. A single sheet (8.5" x 11") of handwritten notes (front and back, as needed) may be used for the exam.

<u>Class Presentations</u>: 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, 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 31 (Political Polling since this is the week before the election)
   November 7
   November 19
   November 26
   December 3
   December 7 (During the Final Exam time of 12:00-1:45)

<u>Grades</u>: The final numerical grade will be determined as follows:

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

<u>Tentative Schedule of Topics</u>

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 (other than nonresponse)   2 classes
        Frame Design and Error
        Response Bias
        Nonresponse
        Other sources of error

Ranked Set Sampling   1 class