SC323: Statistical Surveys, Censuses, and Society (Fall 2023)

Professor: Jerzy Wieczorek
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Office hours: Available at our Moodle course site

Class meetings: TR 9:30 – 10:45am in Diamond 344

Class materials: Available at our Moodle course site

Textbooks: *Survey Methodology,* **2ⁿᵈ edition** (required)
                        by Groves, Fowler, et al.
                    Complex Surveys: A Guide to Analysis Using R (optional)
                        by Lumley

Course description:

"Revolves around the role of sampling and surveys in the context of U.S. society. We will examine the evolution of census- and survey-taking in the U.S. in the context of its economic, social, and political uses, eventually leading to discussions about the accuracy and relevance of survey responses, especially in light of various kinds of sampling and nonsampling errors. We will also explore links to sampling methods useful for studying wildlife, forests, and other non-human populations. Students will be required to design, implement, and analyze a survey using rigorous, well-motivated methods. *Prerequisite: Statistics 212."*

In SC212 you learned about the importance of using random sampling to collect data… but you also found that it's not always logistically practical to take a simple random sample. What other sampling methods can help us balance data-collection costs versus statistical precision, and how should our data analyses account for these complex samples? How can we prevent or handle nonresponse and missing data? What are the ethical issues around collecting, storing, and managing sensitive data? We will also discuss the societal role of government-run surveys and censuses around the world. Students will design and carry out a semester-long survey project with applications beyond the classroom.

Course objectives: By the end of the semester, students will be able to:

1. Express specific ways that surveys and censuses influence American institutions and daily life
2. Write questionnaires and design sampling procedures in ways that (a) promote internal and external validity and (b) balance statistical efficiency with implementation costs
3. Use the statistical software R to analyze survey data with design-based and model-based methods, accounting appropriately for the sampling design

4. Write a scientific report that conveys the design, implementation, analysis, and interpretation of a survey & its results
5. Collaborate with teammates to design, implement, analyze, and report the results of a survey

Grades: Your course grade will be determined as follows (subject to change):

Citizenship/discussion/attendance	10%
Homework	20%
Midterm #1	15%
Midterm #2	15%
Final Project	40%
Total	100%

Moodle: I will be posting all HW assignments on our Moodle site along with hints, schedule updates, and other important class-related info. Check the Moodle site early and often at https://moodle.colby.edu

Class sessions: Regular attendance is essential and in-class participation is expected – please take it seriously. Everyone will receive a grade for in-class participation that will be incorporated into your final grade. You need to attend class and you need to be prepared for class. Check the Moodle site for reading assignments prior to class meetings. At times, class will involve activities based on these readings. This class brings together students with varying backgrounds in science, math, and statistics, so it is especially vital that you raise questions in class when you don't understand a particular topic, or if you have a perspective on a topic that you feel would contribute to class discussion. **The use of laptops/smartphones/tablets/etc. is allowed only for course-related purposes.**

Citizenship: Much of the work done for this course relies on working with others. You are expected to participate fully in both class and in-group assignments. You will be graded on this both by the instructor and by the other members of your group. Occasionally I will ask you to fill out peer citizenship assessment forms for your group. These evaluations are confidential and anonymous in the sense that only I will see the results; other students in the class will not. I will, however, provide feedback if necessary. The purpose of these assessments is only to ensure that everyone is participating fully and working together, NOT to assess someone's strengths and weaknesses with the class material.

Homework: Readings and selected problems will be assigned regularly. Some homework problems will require extensive use of the computer package RStudio. Although you are encouraged to discuss problems with each other, I expect each person to submit his or her own work. You may choose to work with a partner on data analyses and thus produce the same computer output – that's okay, but I want written interpretations and responses to be in your own words.
Homework due dates and times will be posted on Moodle. Turn in homework assignments via Moodle by 4pm on the due date. *Late homework will not be accepted,* in order to let me grade everyone's work quickly and give you timely feedback. The professor will not grant extensions except for documented illness or other extreme circumstances.

Exams: There will be two mid-term exams. These exams will focus on your ability to express an understanding of statistical concepts, to interpret the output of statistical software, and to engage in statistical thinking on open-ended questions. The exams may involve both in-class and take-home components.

See our Moodle page for the two exam dates. **You must meet with me within the first two weeks of classes if you need to reschedule an exam date or request accommodations.** In general, extensions will not be granted for students because they are behind on work, had a busy week, etc. Extensions for **reasonable academic purposes** (e.g. job interview) or **extreme circumstances** (e.g. hospitalization) will generally be granted.

Data analysis project: Your final exam will consist of a complex-survey design and data analysis project that you will work on with several other classmates. This project will be substantially more sophisticated than in SC212, requiring a complex sampling design; rigorous questionnaire testing and data-management planning; post-collection processing and adjustment for nonresponse; etc. Teams will be expected to carry out a study with real applications beyond our classroom. For example, you may find a sponsor/client with a real question they need answered; or choose a broadly-interesting topic and undergo IRB review so that the anonymized dataset you collect can be publicly released. Your grade will be based on project assignments throughout the semester, including a presentation during our final exam timeslot.

Software: We will be using the software package RStudio to analyze data: https://rstudio.colby.edu

To install R & RStudio on your own machine, first download R (the programming language) here: https://cran.r-project.org/ Then download RStudio (a development environment for R) here: https://www.rstudio.com/ For exams, you will also need a scientific calculator.

Masks: According to guidance from the Dean of Faculty, "Regardless of campus-wide policies, faculty and teaching staff may require masks in classrooms and other teaching spaces." Depending on conditions, I may expect the SC323 classroom to mask in order to protect those of us with compromised immune systems, those of us with high-risk family members, and those of us who simply want to avoid transmitting the virus to others or being re/infected themselves.

Academic accommodations:

I am available to discuss academic accommodations that any student with a documented disability may require. Please note that you will need to provide a letter from the Dean of Studies Office documenting your approved accommodations. *Please meet with me within two weeks of the start of the semester to make a request for accommodations so that we can work together with the College to make the appropriate arrangements for you.* Colby's Office for Student Access and Disability Services is the primary contact for accommodations and any questions related to educational testing and documentation: https://life.colby.edu/get-support/access-disability-services/

Sexual misconduct/Title IX statement:

Colby College prohibits and will not tolerate sexual misconduct or gender-based discrimination of any kind. Colby is legally obligated to investigate sexual misconduct (including, but not limited to sexual assault and sexual harassment).

If you wish to speak confidentially about an incident of sexual misconduct, please contact Colby Counseling Services (207-859-4490) or Colby's Title IX Coordinator, Emily Schusterbauer (207-859-4266).

Students should be aware that faculty members are considered responsible employees; as such, if you disclose an incident of sexual misconduct to a faculty member, they have an obligation to report it to Colby's Title IX Coordinator. "Disclosure" may include communication in-person, via email/phone/text, or through class assignments.

To learn more about sexual misconduct or report an incident, visit https://www.colby.edu/sexualviolence/

Academic honesty & consequences for academic dishonesty:

Honesty, integrity, and personal responsibility are cornerstones of a Colby education and provide the foundation for scholarly inquiry, intellectual discourse, and an open and welcoming campus community. These values are articulated in the Colby Affirmation and are central to this course. Students are expected to demonstrate academic honesty in all aspects of this course.

Academic dishonesty includes, but is not limited to: plagiarism (including quoting sources without " " around the borrowed words and a citation); presenting another's work as one's own; buying or attempting to buy papers or projects for a course; fabricating information or citations; knowingly assisting others in acts of academic dishonesty; violating clearly stated rules for taking an exam or completing homework; misrepresentations to faculty within the context of a course; and submitting the same work, including an essay that you wrote, in more than one course without the permission of instructors.

Academic dishonesty is a serious offense against the college. Sanctions for academic dishonesty are assigned by an academic review board and may include failure on the assignment, failure in the course, or suspension or expulsion from the College.

For more on recognizing and avoiding plagiarism, see:
https://libguides.colby.edu/avoidingplagiarism

For resources and information on academic integrity, see:
https://www.colby.edu/academics/academic-integrity/

The Colby Affirmation:

Colby College is a community dedicated to learning and committed to the growth and well-being of all its members. As a community devoted to intellectual growth, we value academic integrity. We agree to take ownership of our academic work, to submit only work that is our own, to fully acknowledge the research and ideas of others in our work, and to abide by the instructions and regulations governing academic work established by the faculty. As a community built on respect for ourselves, each other, and our physical environment, we recognize the diversity of people who have gathered here and that genuine inclusivity requires active, honest, and compassionate engagement with one another. We agree to respect each other, to honor community expectations, and to comply with College policies. As a member of this community, I pledge to hold myself and others accountable to these values.
https://www.colby.edu/academics/academic-integrity/the-colby-affirmation/