

Survey Sampling
Statistics 4234/5234 — Fall 2018
Tue & Thu 6:10pm–7:25pm, 203 Mathematics

Instructor: Ronald Neath
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Office hours: Time and location to be announced

Course description: This course is concerned with sampling methodology in finite populations. We will cover simple random sampling, stratification, cluster sampling, and unequal probability sampling; and develop ratio and regression estimation methods for simple random and stratified samples. Model-based and Bayesian approaches to survey sampling will be introduced, and contrasted with the classical design-based approach. By the end of the course students will be able to distinguish between different sampling schemes, identify suitable sampling methods based on known characteristics of the population, and conduct statistical analysis of survey data.

Prerequisite: Statistics 4204/5204 or the equivalent.

Textbook: The required text is *Sampling: Design and Analysis, second edition*; by Sharon L. Lohr. We will cover Chapters 1 through 6, and selected topics from the remaining chapters.

Computing: Coursework will require the use of statistical software. Many examples will be given using the free package R, which can be downloaded at www.r-project.org. You may use a different program if you wish, but the instructor will only be able to help you with R.

Homework: Homework assignments will consist of selected exercises from the text, and will be posted to CourseWorks approximately two weeks in advance of the due date. There will be six assignments, due on

1. Tuesday, September 18
2. Thursday, September 27
3. Tuesday, October 9
4. Tuesday, October 23
5. Thursday, November 1
6. Tuesday, November 13

Each assignment will contribute 5% of your course grade.

Homework requirements:

1. (a) Homework can be submitted in class before 6:10pm on the stated due date; homework submissions are not accepted during or after lecture.
(b) Homework can be submitted to the appropriate mailbox in Room 904 SSW; the final deadline for this will be specified with each assignment.
(c) Zero credit will be awarded for papers submitted after the final deadline.

2. Use only $8\frac{1}{2}$ by 11 paper. Multiple pages should be stapled together in the top left corner.
3. Your name, the course number (STAT 4234/5234), and the assignment number should appear at the top of the first page. Your first and last name must be clearly legible.
4. Homework should be typed or handwritten neatly, and well-organized. Problems should be clearly labeled, and presented in the order assigned (i.e., problem 3 should not precede problem 2 in your write-up).
5. Only relevant, annotated computer output should be included in your solutions.
6. Leave sufficient margins and whitespace that the grader may mark point deductions and other comments.
7. Homework submitted on notebook paper with frayed edges will not be accepted.
8. Do not include plastic binder covers.

A portion of the grade on each assignment will be based on *presentation*; any paper that fails to comply with the above requirements will not earn the presentation points.

Exams: There will be two in-class midterm exams and a take-home final.

The midterms are scheduled for

- Tuesday, October 16
- Tuesday, November 20

You will have 75 minutes to complete each midterm. You will need a hand-held calculator, and are further allowed a single (two-sided) $8\frac{1}{2}$ by 11 sheet of original handwritten notes. Additional details (exam format, material covered, seating assignments) will be announced in class about two weeks before the exam.

Each of the midterms will count for 25% of your course grade.

The final exam will be assigned on the last day of class and due by 8:00pm on

- Tuesday, December 18

The final exam is worth 20% of your course grade.

Exam absences: Make-up exams will not be given routinely. If you have a legitimate conflict with an exam date, it is incumbent upon you to make arrangements with the instructor to take the test early. An exam missed due to a documented illness or other unforeseeable (and documented) extraordinary circumstances must be made up before the test papers are returned to the class.

Working together: You are encouraged to discuss homework problems with your classmates, but all work submitted must be your own. If multiple students turn in identical solutions, all of them will receive a zero.

Collaboration on the exams is strictly prohibited. Any students who work together on the final will be given a score of zero.

Grading: Your course grade will be weighted as follows: homework 30%, midterm exams 25% each, and final exam 20%.