



THE OHIO STATE UNIVERSITY

STAT 4194

Group Studies (38859)

Autumn 2026

Syllabus - Instructor Information

Elly Kaizar

Professional Qualifications

PhD, Statistics, Carnegie Mellon University

MS, Statistics, Carnegie Mellon University

BS, Chemistry, University of Pittsburgh

BA, Classics, University of Pittsburgh

Syllabus - Required or Recommended Readings

Lumley, T. (2010). Complex surveys: A guide to analysis using R. John Wiley & Sons.

Syllabus - Course Schedule

Week / Meeting Dates	Topic Coverage & Concepts	Reading
Week 1 Aug 25 & Aug 27	Course Introduction & Statistical Review: Goals of inference; survey vs. census; finite populations. Review of expected value, variance, and linear combinations of random variables. Introduction to R; obtaining and configuring software via OSC.	Ch. 1
Week 2 Sep 1 & Sep 3	Simple and Stratified Sampling: Analyzing simple random samples; stratified sampling; replicate weights; other population summaries.	Ch. 2
Week 3 Sep 8 & Sep 10	Simple and Stratified Sampling (continued): Estimates in subpopulations; design of stratified samples.	Ch. 2
Week 4 Sep 15 & Sep 17	Cluster Sampling: Introduction; describing multistage designs; sampling by size.	Ch. 3 (§§3.1–3.3)
Week 5 Sep 22 & Sep 24	Cluster Sampling (continued) & Graphics: Repeated measurements (§3.4). Why is survey data different? Plotting a table; one continuous variable.	Ch. 3 (§3.4) Ch. 4 (§§4.1–4.3)
Week 6 Sep 29 & Oct 1	Graphics & Midterm Exam 1 Tue: Two continuous variables; conditioning plots; maps. Thu: MIDTERM EXAM 1	Ch. 4 (§§4.4–4.6)

Week / Meeting Dates	Topic Coverage & Concepts	Reading
Week 7 Oct 6 & Oct 8	Ratios and Linear Regression: Ratio estimation; linear regression; is weighting needed in regression models?	Ch. 5
Week 8 Oct 13 only	Ratios and Linear Regression (continued): Linear regression; is weighting needed in regression models?	Ch. 5
Week 9 Oct 20 & Oct 22	Ratios and Linear Regression (continued) & Categorical Data Regression: Is weighting needed in regression models? Logistic regression.	Ch. 5 Ch. 6 (§6.1)
Week 10 Oct 27 & Oct 29	Post-Stratification, Raking, and Calibration: Introduction; post-stratification; raking; generalized raking, GREG estimation, and calibration.	Ch. 7 (§§7.1–7.4)
Week 11 Nov 3 & Nov 5	Post-Stratification, Raking, and Calibration (continued): Basu's elephants; selecting auxiliary variables for non-response.	Ch. 7 (§§7.5–7.6)
Week 12 Nov 10 & Nov 12	Missing Data & Midterm Exam 2 Tue: Topics from Chapter 8; item non-response. Thu: MIDTERM EXAM 2	Ch. 8 (selected) Ch. 9 (§9.1)
Week 13 Nov 17 & Nov 19	Missing Data (continued): Two-phase estimation for missing data; imputation of missing data.	Ch. 9 (§§9.2–9.3)
Week 14 Nov 24 only	Missing Data (continued): Imputation of missing data.	Ch. 9 (§9.3)

Week / Meeting Dates	Topic Coverage & Concepts	Reading
Week 15 Dec 1 & Dec 3	Additional Topics (To Be Determined) & Project Presentations: Tue (Dec 1): Additional topics to be determined. Thu (Dec 3): Project presentations begin.	—
Finals Dec 8	Project Presentations (continued): Final project presentations (Dec 8).	—
Finals Dec 11	Final Project Report Due: Electronic submission of technical report and reproducible R code via Carmen by noon.	—

Course Details - Instructor Contact Details

Office: 404B Cockins Hall, 1958 Neil Ave, Columbus, OH 43210

Email: kaizar.1@osu.edu

Phone: (614) 247-2585 [least reliable]

Course Details - Office Hours

Thursdays, 9:30 - 10:30am in Cockins Hall 404B.

Course Details - Class Meeting Details

Class Meeting Details: 08:00 AM-09:20 AM - Cockins Hall 218 - TR

Course Details - Course Description

Designed to give groups of students an opportunity to pursue special studies not otherwise offered. Prereq: Permission of instructor. Repeatable to a maximum of 15 cr hrs or 3 completions. This course is graded S/U.

Course Details - More About This Course

This course introduces students to the principles and practice of analyzing data collected through complex surveys. Most surveys used in government, public health, social science, and business do not rely on simple random sampling. Instead, they use designs that involve stratification, clustering, and unequal probabilities of selection. Analyzing such data correctly requires methods that go beyond what is covered in a standard statistics course.

Students will learn how to consider and work with survey data from design through analysis, including how sampling decisions affect what conclusions can be drawn and how confidently. The course balances statistical concepts with hands-on data analysis using R, and also addresses practical issues such as handling missing data, adjusting for non-response, and communicating results appropriately. Prior experience with R is helpful but not required. No prior experience with survey data is assumed.

Course Details - Course Learning Outcomes

By the end of this semester, students will be qualified to:

1. **Differentiate** between model-based statistical inference and design-based survey sampling frameworks.
2. **Identify and define** the fundamental structural components of complex designs, including sampling weights, strata, clusters, and finite population corrections.
3. **Execute** robust data summaries and construct weight-aware exploratory data visualizations in R.
4. **Compute** population point estimates and standard errors using survey-appropriate methodologies.
5. **Formulate and execute** design-based approaches to analyze survey data while properly accounting for subpopulation characteristics and sub-domain estimation.
6. **Implement** appropriate techniques to adjust for unit non-response.

Course Details - Course Supplies

- **Required Textbook:** Complex Surveys: A Guide to Analysis Using R by Thomas Lumley. Wiley Series in Survey Methodology. ISBN: 978-0470284308.
- **Required Computing Environment:** R and RStudio accessed remotely via the Ohio Supercomputing Center (OSC). No local software installation is needed. Login credentials and computational allocations will be distributed during the first week of classes.
- **Required Device:** Students must bring a laptop or tablet capable of connecting to OSC during class sessions for in-class exercises and demonstrations.
- **CarmenCanvas:** Regular engagement with Carmen is mandatory for accessing lecture notes, submitting weekly homework completion verification, viewing grade updates, and checking course announcements.

Course Details - Canvas Assignment Schedule

Date	Name	Assignment Type	Points
9/4/26	Homework 1	Assignment	10

Course Details - Grading Policy

Percentage Breakdown

Component	Weight
Weekly Homework	15%
In-Class Quizzes	25%

Component	Weight
Midterm Exam 1 (Week 6)	20%
Midterm Exam 2 (Week 12)	20%
Final Project	20%

Component Specifications

- Weekly Homework: Assignments include both written analytical problems and computational work in R. Homework is graded for completion, rewarding genuine and full attempts at all assigned problems.
- In-Class Quizzes: 20-minute quizzes are held every other week during class, beginning in Week 2. Quizzes are graded for mastery and assess understanding of recent course material.
- Midterm Exams: In-class examinations in Weeks 6 and 12 will assess your understanding and skills related to topics covered in the textbook, class sessions, and assignments.
- Final Project: Full details will be available in Week 2 of the course.

Course Details - Grading Scale

Letter Grade	Percentage Range
A	100% to 93%
A-	< 93% to 90%
B+	< 90% to 87%
B	< 87% to 83%
B-	< 83% to 80%
C+	< 80% to 77%
C	< 77% to 73%
C-	< 73% to 70%
D+	< 70% to 67%
D	< 67% to 60%
E	< 60% to 0%

Course Details - Instructor Policies

The instructor reserves the right to make changes to this syllabus as circumstances require. Any changes announced in class or posted on Carmen supersede the information contained in this document. Students are responsible for staying informed of any updates.

Course Details - Course Policies

This course is governed by The Ohio State University's standard syllabus policies, including statements on academic integrity, disability services, mental health resources, and religious accommodations. All applicable policy language is available at: <https://ugeducation.osu.edu/academics/syllabus-policies-statements/standard-syllabus-statements>. Students are responsible for reviewing and understanding all applicable policies.

Submission and Late Work

Homework Submission: All homework assignments are submitted electronically via Carmen. A deduction of 5% will be applied for each hour the assignment is late. The lowest two homework assignment grades will be dropped at the end of the semester. This policy is intended to provide students flexibility to address difficulties and unexpected events. Please save these drops for those circumstances.

Quiz and Exam Scheduling

Conflicts and Absences: If you are unable to take a quiz or exam for any reason, email the instructor as soon as reasonably possible to make arrangements. Depending on the circumstances, students might be allowed to take a make-up quiz or exam or adjust the course grading scheme to account for the missed quiz or exam. Unexpected absences that are not due to an emergency situation or acute illness may result in a 20% deduction for that quiz/exam grade to maintain

fairness with students who took the exam at the scheduled time.

SLDS Testing: Students taking quizzes and/or exams through SLDS must adhere to SLDS scheduling policy. Students who do not secure a testing spot with SLDS due only to late registration may take the quiz or exam with the rest of the class, or they may receive a 20% deduction similarly to their peers who are not taking assessments with SLDS.

Course Details - AI Use Policy

GenAI can fabricate information (for example, creating citations to sources that do not exist) or omit key information. You are ultimately responsible for the accuracy and integrity of your submitted work. Unless explicitly permitted below, representing AI-generated content as your own work is a violation of the Code of Student Conduct. Please check with your instructor if you have questions.

For assignments that will be graded and are **completed outside of class**, such as homework:

- **Permitted:** You may use GenAI in all stages of the assignment, including the submission of AI-generated text or other content. However, simply copying AI-generated output without engagement is not in the spirit of the course and is unlikely to lead to success on the exams and project.
- **Prohibited:** The materials in this course may be subject to copyright protection. Do not input or allow AI to access external or instructor-created course materials (e.g., assigned readings, slides) into AI systems without explicit instructor permission.
- **Requirement:** You must verify the accuracy of all claims and citations. Students must cite any GenAI use by attaching a process record to each assignment.

For assignments that will be graded and are **completed during the class period or at a testing center**, such as exams and oral presentations, all use of GenAI is prohibited unless explicitly directed otherwise.

Syllabus - University Policies

Office of Undergraduate Education - Standard Syllabus Statements

- [Academic Misconduct](#)
- [Religious Accommodations](#)
- [Accommodations for Disability and Illness](#)
- [Intellectual Diversity](#)
- [Grievances and Solving Problems](#)
- [Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct](#)
- [Copyrights](#)
- [Content Warnings](#)
- [Mental Health Support](#)
- [Resources for Military-Connected Students](#)
- [Campus-wide Class Cancellations](#)