

STAT 343
Sample Survey Theory and Applications
Winter 2025

Instructor: Dr. Yogen Chaubey
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Class Schedule: Tuesdays & Thursdays, 10:15-11:30.
Note: There will be a mid-term break from February 24 to March 2.

Office Hours: Wednesdays, 11:30-12:30.

Text: *Sampling: Design and Analysis*, 3rd Edition, by Sharon L. Lohr, CRC Press (2022).
The textbook will be available at:
<https://www.bkstr.com/concordiastore/home>
Note: Students should order textbooks as early as possible, especially for printed versions in case books are backordered or there are any shipping delays.

Reference: *Sampling Techniques*, 3rd Edition, by William G. Cochran, Wiley (1977).

Assignments: Assignments will be given bi-weekly. They are very important as they indicate the level of difficulty of the problems that students are expected to solve and understand independently. Students are expected to submit assignments **as a single PDF file on the Moodle site**. Solutions must be written up carefully, showing all work for full credit. **Late assignments will not be accepted.**

Midterm Test: There will be one midterm test, based on the material of weeks 1-6, which will contribute up to 30% to your final grade (see the Grading Scheme below). **The midterm test will be held on Thursday, March 06, 2025, in class.**

Final Exam: At the end of the course, the final examination of 3 hrs. duration will be held during the period assigned by Concordia's Exam Office.

NOTE: Students are responsible for finding out the date and time of the final exams once the schedule is posted by the Examinations Office. Conflicts or problems with the scheduling of the final exam must be reported directly to **the Examinations Office, not to your instructor**. It is the Department's policy and

the Examinations Office's policy that **students are to be available until the end of the final exam period.** Conflicts due to travel plans will not be accommodated.

Grading Scheme: The final grade will be based on the following three components:

- (a) Assignments (20%)
- (b) Midterm (30%)
- (c) Final Exam (50%)

NOTE: It is the Department's policy that tests missed for any reason, including illness, cannot be made up. If you miss the midterm test because of illness (to be confirmed by a valid medical note), the final exam can count for 80% of your final grade.

If the grading scheme for this course includes graded assignments, a reasonable and representative subset of each assignment may be graded. Students will not be told in advance which subset of the assigned problems will be marked and should therefore attempt all assigned problems.

IMPORTANT: PLEASE NOTE THAT THERE IS NO "100% FINAL EXAM" OPTION IN THIS COURSE.

Calculators: Only calculators approved by the Department, (with a sticker attached as proof of approval) are permitted for the class test and final examination. For a list of Approved calculators see <http://www.concordia.ca/artsci/math-stats/services.html#calculators>.

Weeks	Chapters
1	Chapter 1: Introduction Basic Terminology for Survey, Sampling Selection Bias Measurement Error Sampling and Nonsampling Errors Why Use Sampling Probability Concepts Used in Sampling
2 & 3	Chapter 2: Simple Probability Samples Types of Probability Samples Framework for Probability Sampling Simple Random Sampling Estimation of Means and Totals Estimation of Proportions Sampling Weights Confidence Intervals Determining Sample Size Randomization Theory for Simple Random Sampling Model-Based Theory for Simple Random Sampling

4 & 5	<p>Chapter 3: Stratified Sampling Definition and Theory Sampling Weights in Stratified Random Sampling Allocating Observations to Strata Defining Strata Model-Based Theory for Stratified Random Sampling</p>
6 & 7	<p>Chapter 4: Ratio and Regression Estimation Estimation of a Ratio Ratio Estimation of a Mean or Total Regression estimation of a Mean or Total Ratio Estimation with Stratified Samples</p> <p>Mid-Term Test</p>
8 & 9	<p>Chapter 5: Cluster Sampling with Equal Probabilities Definition and Notation One-Stage Cluster Sampling Clusters of Equal Sizes Clusters of Unequal Sizes Two-Stage Cluster Sampling Designing a Cluster Sample Systematic Sampling</p>
10 & 11	<p>Chapter 6: Sampling with Unequal Probabilities One-Stage Sampling with Replacement. Two-Stage Sampling with Replacement. Unequal Probability Sampling Without Replacement Randomization Theory Results and Proofs</p>
12	<p>Chapter 8: Non-response & Review Effect of Non-response in Samples Designing Surveys to Reduce Non-response Errors Review</p>

Student Services

You may wish to access the many services available to you as a Concordia student. An overview of these resources can be found here: <https://www.concordia.ca/students/services.html>

Academic Integrity and the Academic Code of Conduct

This course is governed by Concordia University's policies on Academic Integrity and the Academic Code of Conduct as set forth in the Undergraduate Calendar and the Graduate Calendar. Students are expected to familiarize themselves with these policies and conduct themselves accordingly. "Concordia University has several resources available to students to better understand and uphold academic integrity. Concordia's website on academic integrity can be found at the following address, which also includes links to each Faculty and the School of Graduate Studies: <https://www.concordia.ca/conduct/academic-integrity.html>" [Undergraduate Calendar, Sec 17.10.2]

Behaviour:

All individuals participating in courses are expected to be professional and constructive throughout the course, including in their communications.

Concordia students are subject to the [Code of Rights and Responsibilities](#) which applies both when students are physically and virtually engaged in any University activity, including classes, seminars, meetings, etc. Students engaged in University activities must respect this Code when engaging with any members of the Concordia community, including faculty, staff, and students, whether such interactions are verbal or in writing, face to face or online/virtual. Failing to comply with the Code may result in charges and sanctions, as outlined in the Code.

Intellectual Property

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Extraordinary circumstances

In the event of extraordinary circumstances and pursuant to the [Academic Regulations](#) the University may modify the delivery, content, structure, forum, location and/or evaluation scheme. In the event of such extraordinary circumstances, students will be informed of the change.