

**STAT 343**  
Sample Survey Theory and Applications  
*Winter 2025*

**Instructor:** Dr. Yogen Chaubey  
Email: [yogen.chaubey@concordia.ca](mailto:yogen.chaubey@concordia.ca)

**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	<b>Chapter 1: Introduction</b> Basic Terminology for Survey, Sampling Selection Bias Measurement Error Sampling and Nonsampling Errors Why Use Sampling Probability Concepts Used in Sampling
2 & 3	<b>Chapter 2: Simple Probability Samples</b> 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><b>Chapter 3: Stratified Sampling</b>                  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><b>Chapter 4: Ratio and Regression Estimation</b>                  Estimation of a Ratio                  Ratio Estimation of a Mean or Total                  Regression estimation of a Mean or Total                  Ratio Estimation with Stratified Samples  <b>Mid-Term Test</b></p>
8 & 9	<p><b>Chapter 5: Cluster Sampling with Equal Probabilities</b>                  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><b>Chapter 6: Sampling with Unequal Probabilities</b>                  One-Stage Sampling with Replacement.                  Two-Stage Sampling with Replacement.                  Unequal Probability Sampling Without Replacement                  Randomization Theory Results and Proofs</p>
12 & 13	<p><b>Chapter 8: Non-response &amp; Review</b>                  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**

Content belonging to instructors shared in online courses, including, but not limited to, online lectures, course notes, and video recordings of classes remain the intellectual property of the faculty member. It may not be distributed, published or broadcast, in whole or in part, without the express permission of the faculty member. Students are also forbidden to use their own means of recording any elements of an online class or lecture without express permission of the instructor. Any unauthorized sharing of course content may constitute a breach of the [Academic Code of Conduct](#) and/or the [Code of Rights and Responsibilities](#). As specified in the [Policy on Intellectual Property](#), the University does not claim any ownership of or interest in any student IP. All university members retain copyright over their work.

**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.