

**STAT 343**  
Sample Survey Theory and Applications  
*Winter 2023*

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- Office Hours:** Tuesdays, 12:00-13:30.
- Text:** *Sampling Design and Analysis*, Third 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:** There will be 4 or 5 assignments. Assignments 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 weekly **as a single PDF file on 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 1-7, which will contribute up to 25% to your final grade (see the Grading Scheme below). **The Midterm test will be held on Thursday, March 09, 2023 in class.**
- Final Exam:** At the end of course, there will be final examination 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 (25%)
- (c) Final Exam (55%)

**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](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 Types of Probability Samples Probability Concepts Used in Sampling
2 & 3	<b>Chapter 2: Simple Probability Samples</b> Framework for Probability Sampling Simple Random Sampling Estimation of Means and Totals Estimation of Proportions Sampling Weights Confidence Intervals Determining The Sample Size Randomization Theory for Simple Random Sampling Model-Based Theory for Simple Random Sampling
4 & 5	<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 Sampling

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</p> <p><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          Weighting for Differential non-response          Imputation for Non-response</p>

**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.

**Use of Zoom**

**Note: Zoom is included as an institutionally-approved technology. This means we have been assured of the privacy protections needed to use freely within the classroom.**

Zoom might be used in this course to facilitate learning at a distance. It may be used to record some or all of the lectures and/or other activities in this course. If you wish to ensure that your image is not recorded, speak to your instructor as soon as possible.

Also, please note that you may not share recordings of your classes and that the instructor will only share class recordings for the purpose of course delivery and development. Any other sharing may be in violation of the law and applicable University policies, and may be subject to penalties.

**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.