

STAT 343
Sample Survey Theory and Applications
Winter 2019

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Office Hours: Wednesdays, 11:30-13:00.

Text: *Sampling: Design and Analysis*, 2nd Edition, by Sharon L. Lohr, Duxbury Press (2010).

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

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

Scheme:

- (a) Assignments (20%)
- (b) Midterm Test (32%)
- (c) Final Exam. (48%)

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.**

Notes:

- a. The midterm will take place in class on **Thursday, March 5, 2019.**
- b. Midterm test will cover until weeks 7 inclusively.**
- c. There will be no make-up tests.
- d. The final examination will cover everything taught in the course.
- e. Assignments will be handed bi-weekly and collected in class.
- f. Late assignments will not be accepted.
- g. There are no supplemental privileges in this course.

Weeks	Chapters
1	Chapter 1: Introduction Why use surveys? What is a good survey? Basic terminology for survey, sampling Sources of error
2 & 3	Chapter 2: Simple Probability Samples Definitions of Probability sampling Simple Random Sampling Estimation of means and totals Estimation of proportions Sampling weights Confidence Intervals Determining sample size Systematic Sampling Randomization theory results for SRS Prediction Approach for SRS Use an SRS
4 & 5	Chapter 3: Stratified Sampling Definition and theory Sampling weights in Stratified Random Sampling Allocation of sample to strata Defining strata Model based inference for Stratified Random Sampling Quota sampling
6 & 7	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 Mid-Term Test
8 & 9	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

10 & 11	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
12 & 13	Chapter 8: Non-response & Review Effect of non-response in samples Designing Surveys to reduce non-response errors Weighting for differential non-response Imputation for non-response Parametric models for Nonresponse

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: concordia.ca/students/academic-integrity." [Undergraduate Calendar, Sec 17.10.2]