SPRING 2018 - STAT 410 E100

# STATISTICAL ANALYSIS OF SAMPLE SURVEYS (3)

*Class Number: 4385* *Delivery Method: In Person*

## Overview

COURSE TIMES + LOCATION:

We 4:30 PM – 5:20 PM
AQ 4150, Burnaby

Mo 4:30 PM – 6:20 PM
RCB 8100, Burnaby

EXAM TIME + LOCATION:

Apr 18, 2018
Wed 7:00 PM – 10:00 PM
Location: SSCC 9000, Burnaby

INSTRUCTOR:

Davis, Jack
jackd@sfu.ca
Office: SC-P9316

PREREQUISITES:
STAT 350.

## Description

CALENDAR DESCRIPTION:
An introduction to the major sample survey designs and their mathematical justification. Associated statistical analyses. Quantitative

COURSE DETAILS:
**Course Outline:**

This course covers the major ideas and methods of modern survey sampling.

1. Ideas of sampling, overview of application areas. Use of the free statistical software package R to select random samples and explore sampling ideas through simulation and graphics.
2. Simple Random Sampling: Selecting random samples with and without replacement, concept of population and sampling frame, estimating means, totals, and proportions, the finite population correction factor, confidence intervals, use of the normal approximation, choosing the sample size.
3. Unequal probability sampling. How to select a sample of units with unequal selection or inclusion probabilities, unbiased estimation with unequal probability designs.
4. Stratified Random Sampling: Stratification of a population, selecting stratified random samples, advantages of stratification, gains in precision, confidence limits, optimal sample sizes, stratification after selection.
5. Ratio and Regression Estimation: Use of auxiliary information, bias, mean square error, gains in precision, confidence intervals, design versus model based approaches.
6. Cluster and systematic Sampling: Selection and estimation methods, potential advantages and disadvantages.
7. Multi-Stage Sampling: Organization of the population into units of different sizes, selection in stages, estimation.
8. Double Sampling: Multiphase sampling for ratio estimation and for stratification.
9. Selected topics in modern survey sampling. Topics of current importance such as network sampling, spatial sampling.

## Grading

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|---|---|
| Assignments | 20 |
| Midterm | 25 |
| Project | 10 |
| Final | |

NOTES:
***Above grading is subject to change.***

## Materials

REQUIRED READING:

**Required Text:**

***Sampling, 3rd Edition (2012),*** by S.K. Thompson, published by John Wiley and Sons.
Text is also available as an ebook online through the SFU Library.

RECOMMENDED READING:

DEPARTMENT UNDERGRADUATE NOTES:

**Students with Disabilites:**
Students requiring accommodations as a result of disability must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca

**Tutor Requests:**
Students looking for a Tutor should visit http://www.stat.sfu.ca/teaching/need-a-tutor-.html. We accept no responsibility for the consequences of any actions taken related to tutors.

REGISTRAR NOTES:

SFU's Academic Integrity web site http://students.sfu.ca/academicintegrity.html is filled with information on what is meant by academic dishonesty, where you can find resources to help with your studies and the consequences of cheating. Check out the site for more information and videos that help explain the issues in plain English.

Each student is responsible for his or her conduct as it affects the University community. Academic dishonesty, in whatever form, is ultimately destructive of the values of the University. Furthermore, it is unfair and discouraging to the majority of students who pursue their studies honestly. Scholarly integrity is required of all members of the University. http://www.sfu.ca/policies/gazette/student/s10-01.html

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MODIFIED BY:

Department, Statistics Actuarial (stat) on 2017-11-22 11:58 AM

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