

STAT 4520: Sampling Techniques I, Fall 2012 (A01)

Tentative Course Outline

Instructor: Brad Johnson
Office: 322 Machray Hall
E-mail: brad.johnson@umanitoba.ca (**Note:** I will only respond to e-mail from UManNet ID's)

Class-time: TTh 8:30 a.m. – 9:45 a.m.

Location: 316 Machray Hall

Office hours: Open door policy — if my door is open, I am available for questions.

Calendar Description: A development of sampling theory for use in sample survey problems, in regression estimates, in systematic sampling, sources of errors in surveys.

Prerequisite(s): STAT 3800 (or STAT 3600 or 005.360) (C), STAT 3480 (or 005.348) (C) [or STAT 3120 (or 005.312) (C) and STAT 3130 (or 005.313) (C)], or consent of department.

Course web-page: Course materials will be made available through the Angel Learning system (<https://angel.cc.umanitoba.ca/>).

Textbook: *Model Assisted Survey Sampling*. Carl-Erik Särndal, Bengt Swensson & Jan Wretman. Springer Series in Statistics. Springer: New York (2003). [also available from amazon.ca]. Also on 2 hour reserve in the science library.

Other Resources: Not required. On 2 hour reserve in the Science Library
Sampling Techniques (3rd Ed.). W. G. Cochran. Wiley: New York (1977).
Sampling: Design and Analysis. S. L. Lohr. Duxbury Press: Toronto (1999).

Software: We will also be making use of the software package *R*. It is freely available for Linux, Macintosh and Windows from *The Comprehensive R Archive Network* at <http://cran.r-project.org/>. Please download and install.

Topics: This is a tentative list of topics we will cover:

- Introduction, basic concepts and definitions (Chapter 1).
- Basic ideas in probability samples (Chapter 2).
- Unbiased estimation for element sampling designs — SRS, Systematic Sampling, Stratified Random Sampling (Chapter 3).
- Single stage cluster sampling (parts of Chapter 4).
- Ratio and regression estimates (parts of Chapters 5, 6 and 7)
- Other topics as time permits.

Midterm Exams: There will be 2 in-class mid-term exams, each worth 22.5% of your final grade. The tentative dates are October 4 and November 6 (2012) but these are **subject to change**.

Note: There will not be any makeup (deferred) mid-term exams for this course. If you miss a mid-term exam, **have a valid excuse**, and **notify me within 48 hours of the scheduled exam**, your final exam will be re-weighted to account for an additional 22.5% of your final grade per test.

Assignments: There will be no *formal* assignments for this course. The distributed lecture notes have a number of exercises and questions, which I may add to. The midterm tests and final examination will be based, in part, on these or similar problems. You are free (and encouraged) to work in groups on these but you must be able to complete the work individually on tests/examinations. Additional problems may be posted to the Desire2Learn system (universityofmanitoba.desire2learn.com).

Project: During the term you will be required to complete a group project worth 15% of your final grade. The groups and topics will be determined by myself and more information will be given early in the term.

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| Grading Scheme: | Mid-term Test 1 | 22.5% |
| | Mid-term Test 2 | 22.5% |
| | Project | 15.0% |
| | Final Exam | 40% |
| | Total | 100% |

Voluntary Withdrawal: The voluntary withdrawal deadline is **November 14, 2012**.

Academic Dishonesty: It is important that you understand what constitutes academic dishonesty and that you are familiar with the very serious consequences. Please be familiar with the information contained in the *General Academic Regulations >> Academic Integrity* section of the Academic Calendar (see <http://umanitoba.ca/calendar>). The Faculty of Science home page at www.umanitoba.ca/science also contains links regarding academic and disciplinary matters (under *Undergraduate Studies*).

2011 Pandemic Advisory: Should major disruptions to university activities occur as a result of a pandemic, the course content, marks breakdown, and other provisions of this document may be adjusted as the circumstances warrant.

2012-2013 REGISTRATION ADVISORY: IMPORTANT NOTE TO STUDENTS FROM THE FACULTY OF SCIENCE:

It is your responsibility to ensure that you are entitled to be registered in this course. This means that you:

- have the appropriate prerequisites, as noted in the calendar description, or have permission from the instructor to waive these prerequisites;
- have not previously taken, or are concurrently registered in, this course and another that has been identified as “not to be held with” in the course description. For example, BIOL 1000 cannot be held for credit with BIOL 1020.

The registration system may have allowed you to register in this course, but it is your responsibility to check. If you are not entitled to be in this course, you will be withdrawn, or the course may not be used in your degree program. There will be no fee adjustment. This is not appealable. Please be sure to read the course description for this and every course in which you are registered.