

STAT 4100
Statistical Inference I
Theory of Point Estimation
Fall 2011

Calender Description

Introduction to methods of estimation, including asymptotic and Bayesian methods. Not to be held with the former STAT 4140.

Prerequisite STAT 3800 (or the former STAT 3600 or 005.360).

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Office hours: Mondays & Wednesdays, 10:30 a.m. to 12:00 a.m. or by appointment.

Mark Breakdown

Homework (every week)	5%
2 Midterm Tests (October 21 and November 18, 2011, from 3:30–5:30 Room 316)	40%
Final Examination (150 minutes, time and placed to be announced)	55%

Grade cut-offs

The following are the minimum percentage grades required to receive each of the various letter grades: A+ (90%), A (80%), B+ (75%), B (70%), C+ (65%), C (60%), D (50%).

There is an additional requirement for obtaining a C or a D in the course: to obtain a grade of C or better, you must obtain at least 50% on the final examination; to obtain a D you must obtain at least 40% on the final examination.

Homeworks

Homeworks are due at the start of class (time will be announced). Homeworks submitted late will be severely penalized. Homeworks submitted after the solutions are posted or after the graded assignments are return to students will not be marked and receive a grade of 0. Obviously, exceptions can be made to the above policy if special/exceptional circumstances warrant them (e.g., serious illness).

Tests

The midterm tests and the final examination are closed book. Statistical tables will be provided if required. A non-programmable calculator is necessary (graphing calculators are not permitted). However, other electronic devices, such as cell phones and MP3, are strictly prohibited.

There will be NO make-up midterm tests. Students who miss the midterm tests with legitimate reasons will have the midterm weights added to the final examination.

Recommended Text Books

I will use my course own notes. However, I recommend to use the following textbooks for further reading and exercises.

- (1) **Mathematical Statistics** (Second Edition)
by: Jun Shao
Springer Texts in Statistics
ISBN 0-387-95382-5
2003.
- (2) **Probability and Statistical Inference**
by: Nitis Mukhopadhyay
Marcel Dekker
ISBN 0-8247-0319-0
2000.
- (3) **Statistical Inference** (Second Edition)
by G. Casella and R.L. Berger
Duxbury/Thomson Learning
ISBN 0-534-24312-6
2002.
- (4) **Introduction to Mathematical Inference** (Sixth Edition)
by R.V. Hogg, J.W. McKean and A.T. Craig
Pearson/Prentice Hall
ISBN 0-13-008507-3
2005.

Voluntary Withdrawal

Note that the voluntary withdrawal date is November 17, 2010 (by which time you will have received your marks for the test and several assignments).

Academic Dishonesty

It is important that you understand what constitutes academic dishonesty and that you are familiar with the very serious consequences. Links to resources that describe academic dishonesty (including plagiarism, cheating, inappropriate collaboration and examination impersonation) can be found at:

<http://www.umanitoba.ca/faculties/science/student/webdisciplinedocuments.html>

or through the Faculty of Science home page at:

<http://www.umanitoba.ca/faculties/science>

Typical penalties imposed within the Faculty of Science for academic dishonesty are also described.

2011-2012 REGISTRATION ADVISORY

Important Note from the Dean 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;
- 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, STAT 1000 cannot be held for credit with STAT 2220.

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.

Tentative Topics

Basic concepts including parametric non-parametric and semi-parametric models; Exponential family; Location-scale family; Introduction to various approaches of statistical inference; The Sufficiency Principle (sufficiency, minimal sufficiency, completeness, ancillarity, Information); The Equivariance Principle; Moments and maximum likelihood methods; Bayesian method; Unbiasedness; Bias reduction techniques. Mean Square Error; Asymptotic evaluation; Minimum variance unbiased estimators; Loss function optimality.