

TENTATIVE Course syllabus, last updated March 19, 2018

PNB 3XE3

Inferential Statistics, Spring 2018

Lecture: Tuesdays & Thursdays, 1:30 - 3:30 PM, BSB 136

Labs: Tuesday & Thursdays, 3:30 - 4:30 PM, BSB 241/244

Instructor: Ali Hashemi (hashea@mcmaster.ca)

Office Hours: By appointment

Psychology Building (PC 428)

905-525-9140, ext. 24489

Notes:

- To contact the instructor or TA, **you must use your @mcmaster.ca email account.** Emails from non-mcmaster addresses are often filtered as spam, and ambiguous, non-mcmaster emails are not easily linked to individual students. **If you want a timely response (if any), you must use your McMaster email address & and include '3XE3' in the subject.**
- Please see the PNB 3XE3 Avenue To Learn page for the most recent version of this syllabus.

Course Assistance

Please post any course-related questions to Avenue (click on PNB 3XE3 and go to the Discussion tab). Rather than emailing the instructor you should post your question on Avenue (unless it is of a personal nature). Others will likely have the same question and will benefit from seeing the answer. Your instructor will be monitoring the Avenue discussion board several times daily and you will get a fast response this way.

Course Description

This course is designed as an introduction to data-driven decision-making, or as the title suggests, how to make effective inferences using data and statistical methodology. Students should gain a strong foundation of what inferential statistics are and why we use them. The course will be taught in a cumulative manner, where students will first be taught what hypothesis testing is, and then given the tools to test different hypotheses. These tools will include t-tests & analysis of variance and their non-parametric, rank-randomization equivalents, as well as chi-square. Critically, emphasis will be put on data visualization, and how statistical tests relate to standard figures/plots (e.g., how to relate a t-test and bar graph).

Both the lecture and lab/tutorial components of the course are **mandatory**. Lab work is to be completed and submitted according to the weekly schedule for your lab section.

Prerequisite(s): PNB 2XE3

Textbook

Fundamental Statistics for the Behavioural Sciences, 9th Ed. (7th and 8th editions are okay as well)

David C. Howell; ISBN-13: 978-1-305-65297-2.

Some supplementary readings may be added as the term progresses, and will be provided via Avenue. We may also use Dr. David Howell's (the textbook author) very useful website for the book, which includes problem solutions, student guides, and lots of other useful material to help you in the course: <https://www.uvm.edu/~dhowell/fundamentals9/index.html>. The online portion of the 9th edition is not yet complete, so the author refers readers to the 8th edition for some resources: <http://www.uvm.edu/~dhowell/fundamentals8/>. The 7th edition site is mostly the same: <http://www.uvm.edu/~dhowell/fundamentals7/>

Statistical software: MS Excel and R.

MacID

You will need to activate your MacID if you have not already done so, to

work on the computers in the labs, and to receive course emails. See <http://www.mcmaster.ca/uts> for information on obtaining and activating your MacID.

Avenue To Learn

Students should check the PNB 3XE3 discussion group on Avenue (<http://avenue.mcmaster.ca/>) on a daily basis for questions and answers, and also check the Course Announcements section. **The discussion should be the first place you go to ask a question.** The instructor and TA will be checking here at least once daily.

Assessment

There will be 3 exams: two midterm exams during class time, and a final exam (with two parts) on the final day of class. Exams may be a mixture of written and multiple-choice questions, including questions where you need to work out mathematical statistical problems by hand, and then report (written) or choose the best alternative (multiple choice) based on your calculations. You may bring only a McMaster approved calculator, pencils and erasers suitable for multiple-choice scan sheets, and your McMaster student ID card to the exams. Sheets with formulae (if required) will be supplied for you. The grading scheme is described below. The instructor reserves the right to alter the evaluation scheme if necessary.

Labs	10%
Midterm 1	20%
Midterm 2	20%
Midterm 3 (Final Exam Part 1)	20%
Final Exam Part 2 (cumulative)	30%

Lab/Tutorial Work

Attendance at labs/tutorials is mandatory, and attendance will be taken. Each lab will involve some combination of written and/or computer based problem solving, guided by your TA. Work must be completed and submitted during the corresponding lab time to earn credit for each session. Absence or submissions outside of lab time will earn grades of zero for that lab. There will be no make-up assignments. Please let us know ASAP if you can't make your lab session. You must attend YOUR OWN scheduled lab section (prior permission required to change!).

Changes in course requirements

The university reserves the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check McMaster email and course websites weekly during the term and note any changes.

The professor reserves the right to change any and all course requirements if the need should arise. Any change in the course requirements will be posted on the webpage and emailed to the class, and the details will be announced in class. Any concerns about announced changes should be addressed with the professor as soon as the changes are announced.

Academic Integrity Policy

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g., the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university. It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at <http://www.mcmaster.ca/academicintegrity>

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one’s own or for which other credit has been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations.

Missed Assessment

In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”. Please note these regulations have changed beginning Fall 2015.

If you have any questions about the MSAF, please contact your Associate Dean’s office.

All excuses for missed exams & assignments must be submitted through the office of the Associate Dean of your faculty. It is then also YOUR responsibility to speak with your instructor as soon as possible (within 48 hours of missing an exam). Missed lab sessions/work will count as zero for that lab (no make-ups). Missed midterms (with approved absence) will sit a make-up exam (possibly of a different form, including written or in-person oral exam), or score zero; **missed midterm exams will NOT be re-weighted to the final exam.**

Tentative Course Outline

The weekly coverage might change as it depends on the progress of the class. However, you must keep up with the reading assignments.

Class/Date	Content
May 1, 2018	<ul style="list-style-type: none"> • Introduction & course overview; Review; Intro to t-tests. • Readings: Chapters 8 & 12 • Labs begin TODAY and will occur after every class, unless otherwise noted.
May 3, 2018	<ul style="list-style-type: none"> • t-tests: two dependent samples • Readings: Chapter 13
May 8, 2018	<ul style="list-style-type: none"> • t-tests: two independent samples • Readings: Chapter 14
May 10, 2018	<ul style="list-style-type: none"> • Power • Readings: Chapter 15
May 15, 2018	<ul style="list-style-type: none"> • Midterm 1 (content from May 1-10) • No lecture, no lab, no readings.
May 17, 2018	<ul style="list-style-type: none"> • Intro to the Analysis of Variance • Readings: Chapter 16
May 22, 2018	<ul style="list-style-type: none"> • ANOVA continued • Readings: Chapter 16
May 24, 2018	<ul style="list-style-type: none"> • Factorial ANOVA • Readings: Chapter 17
May 29, 2018	<ul style="list-style-type: none"> • Repeated measures ANOVA • Readings: Chapter 18
May 31, 2018	<ul style="list-style-type: none"> • Midterm 2 (content from May 17-29) • No lecture, no lab, no readings.
June 5, 2018	<ul style="list-style-type: none"> • Chi-square • Readings: Chapters 19
June 7, 2018	<ul style="list-style-type: none"> • Non-parametric tests • Readings: Chapter 20
June 12, 2018	<ul style="list-style-type: none"> • Review; Finish non-parametric tests if needed. • There will be a lab today on the most requested topic. • New readings: None
June 14, 2018	<ul style="list-style-type: none"> • Final Exam Part 1 (content from June 5-12) • Final Exam Part 2 (cumulative from May 1 to June 12) • New readings: None