

McMaster University
PNB 3XE3: Inferential Statistics
Course Syllabus for Spring 2014

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Contact:

To contact the instructor or TA, please EMAIL using the address provided above.

- this is by far the quickest and most reliable way to contact me! Don't leave voicemail - just email us please.

ALSO - please send email from your @mcmaster.ca account!!! - gmail, hotmail, yahoo, etc. is often filtered as spam!!! It becomes VERY difficult to keep track of students via gmail accounts, when many usernames /aliases are ambiguous with respect to your personal identity at McMaster. PLEASE help us, and correspond via your McMaster email address for this class. Emails from non-mcmaster addresses may experience substantial delays in getting a response (if any), depending on how quickly we can figure out who you are.

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 must 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. Avenue will be monitored at least once daily Monday through Friday.

Office Hours: By appointment

Class Times: Tuesday and Thursday from 9:30am to 11:20pm, May 6 – June 19, 2014

Lab Times: Tuesday and Thursday from 11:30am to 12:20pm, May 6 – June 19, 2014

Class Location: Burke Science Building (BSB) Room 108

Lab Location: Burke Science Building (BSB) Room 249

Prerequisites:

PNB 2XE3: Descriptive Statistics or equivalent.

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.

Intended Learning Outcomes:

At the end of this course you will be able to:

1. Recognize, understand, calculate, and interpret statistical inference tests including: t-

tests & Anova and their non-parametric, rank-randomization equivalents as well as Chi-Square.

2. Use SPSS and Excel to organize and analyze data, including calculating and the above tests. Focus will be put on reading statistical output and interpreting its meaning in plain language.
3. Read, report and interpret the results of statistical tests using American Psychological Association format.
4. Given a data set and a research question, determine which of the above methods is best suited to answering the research question, perform the analysis in question, and state your scientific conclusion.

Avenue to Learn:

In this course we will be using McMaster's online course content system, Avenue to Learn. Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

The course website is available to registered students by logging into Avenue:

<http://avenue.mcmaster.ca>

You will need to learn how to use Avenue to access the course content, announcements, and discussions. Detailed instructions for logging in and using Avenue can be found on the website above.

Slides from the lectures will be available on Avenue as PDF files, AFTER the lectures.

Materials

Course textbook:

Fundamental Statistics for the Behavioral Sciences, by David C. Howell, published by Wadsworth. Either the new 8th edition or previous 7th edition is fine.

This is an excellent textbook. Lectures and labs will proceed on the assumption that you have read the assigned chapters. Even if you haven't fully comprehended them yet, it will be to your great benefit to read BEFORE coming to class.

Some supplementary readings may be added as the term progresses and will be provided via Avenue.

We will 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:

<http://www.uvm.edu/~dhowell/fundamentals8/>

The 7th ed. site is mostly the same: <http://www.uvm.edu/~dhowell/fundamentals7/>

Software:

We will use Excel and SPSS, both of which are available in all of the computer labs. Assignments will be completed and submitted during the lab times so students do not need to purchase their own copy of the software.

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:

You should check the PNB-3XE3 discussion group on Avenue on a daily basis for questions and answers, and also check the Course Announcements section.

Assessment

There will be 3 exams: two midterm exams during class time, and a final exam 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.

- Midterm 1, Midterm 2, and Final-Part 1 (aka "Midterm 3"): best 2 of 3, 25% each = 50%
- Final-Part 2 (all course content): 40%
- Lab /Tutorial Work: best 8 out of 11 labs, 1.25% each = 10%

Lab/Tutorial Work:

Attendance at labs/tutorials is mandatory. Each lab will involve some combination of written and/or computer based problem solving. 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.

Missed Assessment:

All excuses for missed exams, assignments, etc. must be submitted through the office of the Associate Dean of your faculty. It is then also **your** responsibility to speak with your professor as soon as possible. Note that this course does NOT typically offer make-up exams or the possibility for late submission of assignments, as allowance for missed work is built in to the assessment structure.

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 their McMaster email and course websites weekly during the term and to 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.

Schedule - Lectures, Topics, Labs & Exams

Class 1: Tuesday May 6th, 2014

LECTURE: Introduction; Course Overview, Syllabus & Evaluation
LAB: Review of 2XE3 (Lab 1), Introduction to SPSS and Calculator-Fu
READINGS: Chapter 8 (review) + Chapter 12 (review)

Class 2: Thursday May 8th, 2014

LECTURE: t-test, two related samples
LAB: Chapter 13 (Lab 2)
READINGS: Chapter 13

Class 3: Tuesday May 13th, 2014

LECTURE: t-test, two independent samples
LAB: Chapter 14 (Lab 3)
READINGS: Chapter 14

Class 4: Thursday May 15th, 2014

LECTURE: Power
LAB: Chapter 15 (Lab 4)
READINGS: Chapter 15

Class 5: Tuesday May 20th, 2014

LECTURE: One-way anova + Midterm 1 Review/Q&A
LAB: Midterm 1 (up to Thursday May 15th, Power)
READINGS: Chapter 16

***** **Midterm 1, Tuesday May 20th, 2014** *****

Class 6: Thursday May 22nd, 2014

LECTURE: One-way and Factorial Anova
LAB: Chapter 16+17 (Lab 5)
READINGS: Chapter 17

Class 7: Tuesday May 27th, 2014

LECTURE: Factorial Anova
LAB: Chapter 17 (Lab 6)
READINGS: Chapter 17

Class 8: Thursday May 29th, 2014

LECTURE: Repeated Measures Anova

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LAB: Chapter 18 (Lab 7)
READINGS: Chapter 18

Class 9: Tuesday June 3rd, 2014

LECTURE: Repeated Measures Anova
LAB: Chapter 18 (Lab 8)
READINGS: Chapter 18

Class 10: Thursday June 5th, 2014

LECTURE: Chi Square
LAB: Chapter 19 (Lab 9)
READINGS: Chapter 19

Class 11: Tuesday June 10th, 2014

LECTURE: Chi Square + Midterm 2 Review/Q&A
LAB: Midterm 2 (up to Tuesday June 3rd, Repeated Measures Anova)
READINGS: Chapter 19

***** **Midterm 2, Tuesday June 10th, 2014** *****

Class 12: Thursday June 12th, 2014

LECTURE: Non-parametric Statistics
LAB: Chapter 20 (Lab 10)
READINGS: Chapter 20

Class 13: Tuesday June 17th, 2014

LECTURE: Non-parametric Statistics & Putting it all together
LAB: Chapter 20 (Lab 11)
READINGS: Chapter 20 + Chapter 21

Class 14: Thursday June 19th, 2014

There will be no lecture or lab section. Class will begin early at 8:30 with a 60-minute open review session during which you may ask questions or we can solve problems together. Midterm 3 (Part 1 of the Final) and the final exam will begin at 9:30. Midterm 3 will cover topics from Class 11 to 13. The final will be a cumulative exam covering all material from the course. They will be packaged together and clearly delineated.

***** **Final Exam & Midterm 3, Thursday June 19th, 2014** *****