

PNB 2XE3: Descriptive Statistics Syllabus

**If you require this information in an alternate/accessible format, please contact Dr. Piskuric at (905) 525-9140 ext. 21331.*

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Emails must be sent from your McMaster address and must include “PNB 2XE3” in the subject heading. Emails sent from other accounts or lacking an appropriate subject heading will not be answered.
Office hours Mondays, 1:00 – 2:30 PM, PC-108
Course Website *Avenue to Learn*, avenue.mcmaster.ca; please check this site regularly for updates.

Teaching Assistants

Lecture TA: Jordan Lass (lassjw@mcmaster.ca)

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Lab TAs: Ali Hashemi (hashea@mcmaster.ca)
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Course Description

Students will learn descriptive, graphical, and exploratory data analysis. We will also discuss hypothesis testing and hypothesis tests applied to means.

Intended Learning Outcomes

By the end of this course, students should be able to:

1. Distinguish between a statistic of a sample and a parameter of a population.
2. Describe distributions in terms on their shape and variability.
3. Interpret and create graphical displays of data, including stem-and-leaf displays, histograms, scatterplots and boxplots.
4. Compute the correlation coefficient (r) between two variables as well as the regression line that predicts one variable from another.
5. Devise null and alternate hypotheses related to specific research questions.
6. Make rational decisions about hypothesis tests (e.g. one- versus two-tailed, choosing alpha).
7. Distinguish between z-tests and t-tests, and apply the correct test where appropriate.
8. Manipulate data (e.g., sort, arrange into tables) in Excel and use formulae to calculate descriptive statistics on these data.
9. Create histograms and scatterplots in Excel, and boxplots in SPSS.

Prerequisites

Registration in an Honours Psychology, Neuroscience & Behaviour or Combined Honours Psychology program

Antirequisites

PSYCH 2RA3, 2RR3. Not open to students with credit or registration in ISCI 2A18 or STATS 2B03.

Course Format

This course consists of 2 50-minute lectures and 1 2-hr lab/tutorial per week.

Lectures	Mon, Thu	16:30 – 17:20	BSB B135	
T01	Wed	09:30 – 11:20	KTH/B123	Ali
T02	Mon	12:30 – 14:20	KTH/B121	Onkar
T03	Thu	12:30 – 14:20	KTH/B121	Tyler
T04	Mon	9:30 – 11:20	KTH/B121	Nadia
T05	Fri	14:30 – 16:20	KTH/B121	Rob

Textbook

Howell, D. C. (2014) *Fundamental Statistics for the Behavioral Sciences, 8th Ed.* Wadsworth.
*Note: this text will also be used for PNB 3XE3.

Software

We will use Excel and SPSS, both of which are available in all McMaster computer labs (open 7 days a week, check online for hours). Lab locations are as follows:
BSB 241/242/244/249 KTH B121/B123 JHE 233A/234

iClickers

Classroom response systems will be used in lectures. Students should purchase an iClicker at the Campus Bookstore (McMaster’s main bookstore), **register their iClicker using their MacID**, and bring it to every class. iClicker questions will serve as real-time feedback for students and the Instructor. iClicker participation is worth 5% of your final grade, and grades will be allocated according to the scheme below. Note that MSAFs will not be accepted for missed iClicker participation. **Use of another student’s iClicker constitutes academic dishonesty and will result in a grade penalty.**

% of lectures participated	0	<20	20-40	40-60	60-80	80-100
Grade	0	1	2	3	4	5

Throughout the course, we will also use the iClicker system to generate data for use in computer labs. **All such data will remain confidential and will be anonymized** (i.e., not linked to your MacID). Data collected will solely be used for instructional purposes, and will not be distributed or reproduced. You are not required to answer any questions that make you feel uncomfortable.

Course Assessment	(%)	
Labs	18	9 @ 2% each
Lab Test	7	2 hr computer test
iClicker participation	5	
Midterm 1	15	MCQ; in class
Midterm 2	15	MCQ; in class
Final Exam	40	Cumulative; MCQ and short answer/ calculations

Labs

The purpose of the Labs is threefold, including (i) to provide you with practice questions that reinforce course content, (ii) to introduce you to statistical software (including Excel and SPSS), and (iii) to give you the opportunity to discuss statistics with your TAs. Your Lab is a great place to ask questions and get help!

There will be 9 Labs in this course, starting on the week of January 18th (see syllabus). You should attend your registrar-schedule lab each week. Labs will consist of a combination of homework questions, computer assignments, and supplementary readings. The content for each week's lab will be posted in Avenue 1 week in advance. You are expected to complete all homework questions and supplementary readings before attending Lab, and to at least familiarize yourself with the computer assignment. A portion of the homework questions and/or computer assignment must be submitted each week for grading ("pre-lab" questions will be identified by the Instructor). Note that – *unless otherwise instructed* – you will not be required to submit the computer assignment each week for grading. However, you should complete the computer assignment on your own and with the help of TAs during Lab sessions, in preparation for the final Lab Test.

Students who miss a Lab will have the weight of that Lab (2%) redistributed to their final exam.

Lab Test

A 2-hour computer test will be administered during your final lab. This Lab Test will be based on the pre-lab and computer assignments assigned throughout the term. Students may bring one handwritten formula sheet to the Lab Test (maximum 8½ x 11 inches). You will be required to submit your Lab Test answers at the end of the 2-hour session, worth 7% of your final grade. If you miss the Lab Test, you will be required to complete a make-up Lab Test on a different day within 1 week of your missed Lab Test. No student will be exempt from completing the Lab Test, regardless of whether the MSAF was submitted.

Midterms and Exams

Both midterms will be exclusively multiple-choice. The final exam will include both multiple-choice and written answer questions. You must bring with you (1) a McMaster-approved calculator (Casio fx991), (2) pencils and erasers suitable for multiple-choice scan sheets, and (3) your McMaster student ID card to all examinations. Sheets with formulae (if required) will be supplied for you. If you miss 1 midterm, the weight of the midterm will be reallocated to the final exam. If you miss both midterms, you will be required to complete a 1 hour oral examination with the Instructor and Lecture TA, worth 15% of your final mark.

Seeking Help

Please ask the course Instructor or TAs for help at any time if you need it. As a learner, it is your responsibility to recognize when you need help and then ask for it.

Student Services

Several services are available on campus to assist students. You are encouraged to visit the **Student Wellness Centre** (<http://wellness.mcmaster.ca>) for mental and/or physical health related issues, the **Student Accessibility Centre** (<http://sas.mcmaster.ca>) for academic or disability-related needs, and the **Student Success Centre** (<http://studentsuccess.mcmaster.ca>) for academic counseling, tutoring, and other academic and career support.

Missed Work Policy

For absences from classes lasting up to 3 days due to a medical or personal reason:

Using the *McMaster Student Absence Form (MSAF)* on-line self-reporting tool, undergraduate students may report absences lasting up to **3 days** and may also request relief for missed academic work worth less than **25%** of the final grade. The submission of medical documentation is normally not required. Students may use this tool to submit a maximum of **one** request for relief of missed academic work per term. Students must **immediately (within 2 days of the missed work)** follow up with their course instructors regarding the nature of the relief. Failure to do so may negate the opportunity for relief. ***The MSAF tool cannot be used to apply for relief for any final examination or its equivalent.***

Students who (1) are absent for more than 3 days, (2) wish to submit more than one request for relief of missed academic work per term, (3) are absent for reasons other than a medical situation, or (4) missed work worth 25% or more of their grade, cannot use the MSAF tool to request relief. They **MUST** report to their Faculty Office to discuss their situation and may be required to provide appropriate supporting documentation. If warranted, students will be approved to use a discretionary version of the MSAF on-line, self-reporting tool.

For absences from classes lasting more than 3 days, for work worth 25% or more, or for the reporting of more than one request for relief per term:

If the reason was medical, the approved McMaster University Medical Form covering the relevant dates must be submitted. The student must be seen by a doctor at the earliest possible date, **normally on or before the date of the missed work** and the doctor must verify the duration of the illness. Relief will not be considered for minor illnesses. If the reason is non-medical, appropriate documentation with verifiable origin covering the relevant dates must be submitted, normally within five working days. In some circumstances, students may be advised to submit a *Petition for Special Consideration (Form A)* seeking relief for missed academic work. In deciding whether or not to grant a petition, adequacy of the supporting documentation, including the timing in relation to the due date of the missed work and the degree of the student's incapacitation, may be taken into account. If the petition is approved the Faculty Office will notify the instructor(s) recommending relief. The student must contact the instructor promptly to discuss the appropriate relief. Failure to do so may negate the opportunity for relief. It is the prerogative of the instructor of the course to determine the appropriate relief for missed term work in his/her course.

Academic Dishonesty

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means, and can result in serious consequences for a student such as the grade of zero on an exam or assignment, loss of course credit with a notation on the student's transcript that reads "*Grade of F assigned for academic dishonesty*", and/or suspension or expulsion from McMaster University. It is your responsibility to understand what constitutes academic dishonesty. For example, plagiarism, improper collaboration, copying and/or use of unauthorized aids in tests and examinations (i.e. cheating) are just a few forms of academic dishonesty. For more information on academic integrity and the various kinds of academic dishonesty, please refer to McMaster's Academic Integrity Policy located at <http://www.mcmaster.ca/academicintegrity>.

Notice of changes to course structure

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 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.

Important Dates

Classes begin	Tuesday, January 5
Last day for registration and drop/add	Wednesday, January 13
Mid-term recess	Monday, February 15 – Saturday, February 20
Last day for cancelling classes	Friday, March 11
Good Friday (no classes)	Friday, March 25
Text and exam ban	Monday, April 4 – Monday, April 11
Last day of classes	Friday, April 8
Exams	Tuesday, April 12 – Friday, April 29

Grades

Grades obtained in PNB 2XE3 will be converted according to the following scheme, which is in general use at McMaster University.

90 – 100%	A+	12
85 – 89%	A	11
80 – 84%	A-	10
77 – 79%	B+	9
73 – 76%	B	8
70 – 72%	B-	7
67 – 69%	C+	6
63 – 66%	C	5
60 – 62%	C-	4
57 – 59%	D+	3
53 – 56%	D	2
50 – 52%	D-	1
0 – 49%	F	0

List of Topics

Week	Date	Topic	Lab	Readings
1	Jan 4	Introduction		Ch. 1
2	Jan 11	Basic concepts; Displaying data		Ch. 2-3
3	Jan 18	Measures of central tendency; Measures of variability	Lab 1: Where's Waldo – Histograms	Ch. 4-5
4	Jan 25	Correlation	Lab 2: Aliens – Means, medians and modes	Ch. 9
5	Feb 1	Regression; Intro to Lab 4	Lab 3: Hamilton Weather – Boxplots	Ch. 10
6	Feb 8		Lab 4: Schikorski, T. & Stevens, C. F. (2001) <i>Nat. Neurosci.</i>	Midterm 1 (Feb. 11)
	Feb 15	Reading week – no classes		
7	Feb 22	The normal distribution	Lab 5: Word Recall – Scatterplots, r^2 and regression	Ch. 6
8	Feb 29	Basic concepts of probability	Lab 6: The normal distribution	Ch. 7
9	Mar 7	Sampling distributions and hypothesis testing	Lab 7: Food preference survey – probability	Ch. 8
10	Mar 14		Lab 8: Nerd Survey – Central Limit Theorem	Midterm 2 (Mar. 17)
11	Mar 21	Hypothesis tests applied to means: One sample	Lab 9: Politics – z- and t- tests	Ch. 12
12	Mar 28	Hypothesis tests applied to means: Two related samples	Lab Test	Ch. 13
13	April 4	Hypothesis tests applied to means: Two independent samples		Ch. 14