

PNB 2XE3 – Descriptive Statistics

Instructor	Nikol Piskuric, Ph.D.
Office	Department of Psychology, Neuroscience & Behaviour, PC-108
Email	piskurn@mcmaster.ca 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.
Course Website	<i>Avenue to Learn</i> , avenue.mcmaster.ca ; please check this site regularly for updates.

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

Teaching Assistants

Lecture TA: Maria Ershova (ershovm@mcmaster.ca)

Office hours: TBA

Lab TAs: Jessica Cali (calij@mcmaster.ca)
Joanna Spyra (spyraj@mcmaster.ca)
Michael Wan (wanm2@mcmaster.ca)
Mike Galang (galangc@mcmaster.ca)
Aimee Battcock (battcoae@mcmaster.ca)

Course Description

In this course, you'll 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, you 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.
10. Analyze data in SPSS (e.g., Independent Samples T-test).

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 three 50-minute lectures and one 2-hr lab/tutorial per week.

Lectures	Tues, Thu, Fri	11:30 – 12:20	BSB B135	Maria
T01	Mon	09:30 – 11:20	KTH/B121	Mike
T02	Mon	11:30 – 13:20	KTH/B121	Michael
T03	Wed	8:30 – 10:20	KTH/B121	Aimee
T04	Thu	9:30 – 11:20	KTH/B121	Jessica
T05	Wed	11:30 – 13:20	KTH/B121	Joanna

Textbook

Howell, D. C. (2016) *Fundamental Statistics for the Behavioral Sciences, 9th Ed.* Wadsworth.

* This text will also be used for PNB 3XE3. You may also use the 8th edition.

Software

Microsoft Excel and SPSS are available in all McMaster computer labs (open 7 days a week, check online for hours). Labs are located in BSB 241/242/244/249, KTH B121/B123, and JHE 233A/234. In addition, all McMaster students have a free subscription to Microsoft Office 365, which can be accessed at <http://www.mcmaster.ca/uts/licensing/msstudents.html>.

iClickers

Classroom response systems will be used in lectures. Students should purchase an iClicker at The Campus Store (McMaster's main bookstore), register their iClicker using their MacID, and bring it to every class.

Academic Accommodation of Students With Disabilities

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail sas@mcmaster.ca. For further information, consult McMaster University's Policy for [Academic Accommodation of Students with Disabilities](#).

Other Student Services

The **Student Wellness Centre** (<http://wellness.mcmaster.ca>) provides a range of counseling options, medical services, and wellness programs. The **Student Success Centre** (<http://studentsuccess.mcmaster.ca>) offers academic, personal, and professional support through a variety of programs, tools and resources.

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.

Course Assessment

Labs

16 (8 @ 2% each)

There are 8 Labs in this course (see syllabus). You should attend your registrar-schedule Lab each week. The purpose of the Labs is to,

- (i) Provide you with practice questions that reinforce course content.
- (ii) Introduce you to statistical software (Excel and SPSS).
- (iii) Give you the opportunity to discuss statistics with your TAs.

Your Lab is a great place to ask questions and get help!

Approximately one week prior to each Lab, Dr. Piskuric will post the lab assignment to Avenue. The lab assignment includes two parts, a pre-lab and a computer assignment. You must submit your pre-lab answers at the beginning of each lab. You should familiarize yourself with the computer assignment prior to attending lab, however, the TA will give you time during lab to work on the computer assignment. Note that – *unless otherwise instructed* – you will not be required to submit the computer assignment for grading. However, the final Lab Test will be based on these 8 computer assignments, so it is in your best interest to complete the computer assignments to the best of your ability. Given appropriate documentation (i.e., MSAF), the weight of missed labs will be redistributed to your final exam.

Lab Test

7

Your final lab session will consist of a 2-hour Lab Test, which will be based on the first 8 computer labs. You will be required to submit your Lab Test answers at the end of the 2-hour period. You may bring one handwritten formula sheet to the Lab Test (maximum 8½ x 11 inches). If you miss the Lab Test, you will be required to complete a make-up Lab Test on a different day within one week of your missed Lab Test. No student will be exempt from completing the Lab Test, regardless of whether the MSAF was submitted.

iClicker participation

5

iClicker 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.

Midterms

32 (2 @ 16% each)

Midterms will be written during class time in BSB 147. Midterms will be exclusively multiple-choice. You must bring to each midterm (1) a McMaster-approved calculator (Casio fx991), (2) pencils and erasers suitable for multiple-choice scan sheets, and (3) your McMaster student ID card. Sheets with formulae (if required) will be supplied for you. If you miss one 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 16% of your final mark.

Final Exam

40

The final exam is cumulative, and will include both multiple-choice and written answer questions. The exam will be scheduled by the registrar and held during the examination period at the end of the semester.

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.

Important Dates

Classes begin	Thursday, January 4
Last day for registration and drop/add	Friday, January 12
Mid-term recess	Monday, February 19 – Saturday, February 25
Last day for cancelling classes	Friday, March 16
Good Friday (no classes)	Friday, March 30
Text and exam ban	Tuesday, April 3 – Tuesday, April 10
Last day of classes	Monday, April 9
Exams	Wednesday, April 11 – Thursday, April 26

Academic Dishonesty

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 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.

Grades

Grades obtained in this course will be converted according to the following scheme.

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

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.

List of Topics

Week	Date	Topic	Lab	Readings
1	Jan 1	No class		
2	Jan 8	Introduction; Basic concepts; Displaying data		Ch. 1-3
3	Jan 15	Measures of central tendency; Measures of variability	Lab 1: Where's Waldo – Histograms	Ch. 4-5
4	Jan 22	Correlation	Lab 2: Aliens – Means, medians and modes	Ch. 9
5	Jan 29	Regression; Intro to Lab 4	Lab 3: Hamilton Weather – Boxplots	Ch. 10
6	Feb 5		Lab 4: Word Recall – Scatterplots, r^2 and regression	Midterm 1 (Fri Feb 9)
7	Feb 12	The normal distribution		Ch. 6
	Feb 19	Reading week – no classes		
8	Feb 26	Basic concepts of probability	Lab 5: The normal distribution	Ch. 7
9	Mar 5	Sampling distributions and hypothesis testing	Lab 6: Food preference survey – probability	Ch. 8
10	Mar 12		Lab 7: Nerd Survey – Central Limit Theorem	Midterm 2 (Fri Mar 16)
11	Mar 19	Hypothesis tests applied to means: One sample	Lab 8: Politics – z- and t- tests	Ch. 12
12	Mar 26	Hypothesis tests applied to means: Two related samples	Lab Test	Ch. 13
13	Apr 2	Hypothesis tests applied to means: Two independent samples		Ch. 14