McMaster University

Psychology, Neuroscience, and Behaviour

COURSE OUTLINE

PNB 2XE3: Descriptive Statistics

Winter 2017

Instructor: **Dr. Nicholas Bock, Ph.D.**
Department of Psychology, Neuroscience, and Behaviour/ Psychology Complex 304
bockn@mcmaster.ca (please include "PNB 2XE3" in the subject of any email you send)

Lectures: Tuesdays and Thursdays, 11:30 – 12:20 pm, BSB B135

Office Hours: Fridays, 11:30 – 12:20 pm, PC 304 (overflow PC 316)

Teaching Assistants:

Anita Acai (acaia@mcmaster.ca)
Jessica Cali (calij@mcmaster.ca)
Maryam Pandi (pandim@mcmaster.ca)
Parker Banks (banksp@mcmaster.ca)
Swapna Krishnamoorthy (krishs6@mcmaster.ca)

Tutorial/Laboratory Sections:

T01	Mo 9:30AM - 11:20AM	KTH B121	Maryam
T02	Mo 11:30AM - 1:20PM	KTH B121	Anita
T03	We 8:30AM - 10:20AM	KTH B121	Jessica
T04	Tu 2:30PM - 4:20PM	KTH B121	Swapna
T05	We 11:30AM - 1:20PM	KTH B121	Parker

Course Website:

Information about the course, including lecture notes and handouts for the laboratories, will be available on McMaster's Avenue to Learn system. The course will appear as *PNB 2XE3:Descriptive Statistics* under the "My Courses" section.

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 of 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 fit 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.

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

Schedule:

Week of	Lecture Topic	Readings	Tutorial
Jan 2	Introduction & basic concepts	Ch. 1-2	
Jan 9	Displaying data; measures of central tendency	Ch. 3-4	
Jan 16	Measures of variability	Ch. 5	Lab 1
Jan 23	Correlation	Ch. 9-10	Lab 2
Jan 30	Regression	Ch. 10 cont'd	Lab 3
Feb 6	The normal distribution	Ch. 6	Lab Quiz
Feb 13	Basic concepts of probability *In-class test Feb 16*	Ch. 7	Lab 4
Feb 20	*Reading Week*		
Feb 27	Sampling distributions and hypothesis testing	Ch. 8	Lab 5
Mar 6		Ch. 8 cont'd	Lab 6
Mar 13	Hypothesis tests applied to means: One sample *In-class test Mar 16*	Ch. 12	Lab 7
Mar 20	Hypothesis tests applied to means: Two related samples	Ch. 13	Lab 8
Mar 27	Hypothesis tests applied to means: Two independent samples	Ch. 14	Lab Quiz
Apr 3	Review		

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). iClicker questions will serve as real-time feedback for students and the Instructor.

Throughout the course, we will 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.

Evaluation:

	(% of final grade)	
Pre-labs	20	8 @ 2.5% each
Lab Quizzes	10	2 @ 5% each
In-class tests	30	2 @ 15% each
Final Exam	40	

Pre-labs:

Each week, the Instructor will post onto Avenue (1) a computer-based assignment and (2) a set of practice questions derived from the Howell text. These exercises will serve as the topic of the weekly lab. Prior to attending each lab, students are expected to complete the practice questions as well as to (at least) familiarize themselves with the computer assignment. Students will be required to submit a portion of the practice questions at the beginning of the tutorial for marking. These questions must be handed in person at the tutorial or they will not be marked. The purpose of the pre-lab is to help students maintain a study schedule, and to make lab time more constructive.

Tutorials:

Students are required to attend their assigned weekly tutorials. The purpose of these is to (1) introduce students to statistical software (Excel and SPSS), and (2) reinforce class content through problem sets and student discussions.

1. Computer portion
The computer assignments are designed to introduce students to statistical software (Excel and SPSS), and to teach data handling techniques that will be helpful in future courses/research. Your TAs will guide you through parts of the computer assignment during the first 30-60 min of each lab; you are required to complete the rest of the lab on your own time, as practice, and in preparation for the lab quizzes.

2. Tutorial portion
During the second portion of the tutorial, TAs will discuss the practice questions, and review important concepts from that week's lectures. This is a great time to ask questions and get help!

Lab Quizzes:

There will be two 2-hr lab quizzes held during tutorial sessions, during which students will complete a modified version of one of the 8 computer assignments assigned throughout the term. Students may bring a sheet of formulae or personal notes. The completed lab will be due at the end of the lab session, and will be graded by the TAs.

Absences & Missed Work:

If you are absent from the university for a minor medical reason, lasting up to 3 calendar days, you may report your absence, once per term, without documentation, using the McMaster Student Absence Form (MSAF). Absences for a longer duration or for other reasons must be reported to your Faculty office, with documentation, and relief from term work may not necessarily be granted. When using the MSAF, report your absence to course instructor or designate. You must then contact the instructor/instructional assistant/other immediately (normally within 2 working days) by email. Please refer to the contact list on the first page of this outline for appropriate email addresses. The instructor/instructional assistant will indicate what relief may be granted for the work you have missed, and relevant details such as revised deadlines, or time and location of a make-up exam/quiz/test. Please note that the MSAF may not be used for final deliverables, nor can it be used for a final examination or its equivalent**.**

Student Services:

A number of services are available on campus to assist students. Students are encouraged to visit the Student Wellness Centre (http://wellness.mcmaster.ca) for mental and/or physical health related issues, or the Student Accessibility Centre (http://sas.mcmaster.ca/) for academic or disability-related needs.

Senate Student Policies:

Students can view full policies here (http://www.mcmaster.ca/policy/Students-AcademicStudies/).

Senate Policy Statements are also available from the Senate Secretariat Office, Room 104, and Gilmour Hall.

Academic Integrity - http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and 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.

The following illustrate only four of many forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained;
- copying or using unauthorized aids in laboratory exercises
- improper collaboration in group work; and
- copying or using unauthorized aids in quizzes, tests and examinations

All students are reminded of the importance of academic integrity, and the serious consequences of academic dishonesty.

Student Code of Conduct - http://www.mcmaster.ca/policy/Students-AcademicStudies/StudentCode.pdf

You acknowledge that your behavior in all aspects of this course should meet the standards of the McMaster University Student Code of Conduct. You understand that any inappropriate behavior directed against any of your colleagues, teaching assistants, or the instructional team will not be tolerated. Disruptive behavior during any session (e.g. lecture, seminar, lab, tutorial) such as talking, sleeping or non-class computing while an individual presents information, or constantly being late, will also not be tolerated. Abuse, ridicule, slander, inappropriate language, and discrimination towards instructors teaching staff, teaching assistants and other students will not be tolerated in any capacity. Shared spaces including e-spaces such as the Avenue to Learn course discussion board are to be considered inclusive and safe.

Copyright Policy:

In this course you will have access to material that is subject to copyright laws. This includes (but is not limited to) textbooks and all resources developed by the instructors such as lab manuals, demonstration videos, quizzes, assignments, tests, class notes and class slides. Under no circumstance are you allowed to share or redistribute this material in any printed or electronic form without the explicit written consent of the copyright holder. This includes posting any course material on Internet bulletin boards, course repositories, social networks, etc.

The instructors and the university reserve the right to alter this outline if necessary.

The instructors and university reserve 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.