

HUMBEHV 3ST3: STATISTICS for HUMAN BEHAVIOUR

Course Syllabus

Fall Term, 2019

The instructor and university reserve the right to modify elements of this 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.

Contact Information

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Email Contact: All emails to the instructor and TAs *must* be sent from your McMaster address and *must* include the term “HUMBEHV 3ST3” in the subject heading. **Emails sent from other accounts or lacking an appropriate subject may not be seen and therefore may not be answered.**

Course website: The website for this course is <http://www.psychology.mcmaster.ca/bennett/humbehv3st3>. Students should check the website periodically during the term for announcements and course materials.

Course Description

This course introduces descriptive, exploratory, and inferential statistics that are commonly used in behavioural research, especially Psychology. The course is designed with the assumption that students have not completed a previous undergraduate course in statistics. The emphasis is placed on understanding the conceptual bases of various statistical analyses – with the goal of preparing students to properly interpret statistical analyses – and less on the actual computation of statistics *per se*.

Prerequisite: Registration in Level III or above of an Honours Human Behaviour (B.A.Sc.) program.

Antirequisites: HUMBEHV 3HB3, SOCSCI 2J03

Course Format

The course consists of three weekly lectures on Monday (11:30 AM-12:20 PM), Wednesday (11:30 AM-12:20 PM), and Friday (1:30-2:20 PM) in BSB 137.

Intended Learning Outcomes

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

1. Distinguish a sample and a population, and understand how the two are linked.
2. Identify various types of experimental variables, and the salient characteristics of distributions.
3. Interpret common statistical graphs.
4. Understand the pros and cons of using a correlation coefficient to measure the association between variables.
5. Understand the appropriate uses and limitations of z , t , and F tests.
6. Understand the logic of Null Hypothesis Significance Testing.
7. Understand the strengths and weakness of using p values to evaluate hypotheses.

Textbook

The textbook for this course is *Fundamental Statistics for the Behavioral Sciences* (9th edition) by D.C. Howell. The companion website for this book is at <https://www.uvm.edu/~dhowell/fundamentals9>. Two copies of this textbook are on two-hour reserve in Thode Library.

Top Hat

The course will use the Top Hat (www.tophat.com) classroom response system which allows you to submit answers to in-class questions using a variety of devices including tablets, laptops, and Apple or Android smartphones. An email invitation to join the system was sent to registered students several days before the start of the term. If you did not receive this email you can register by simply visiting the course's [Top Hat website](#) and use the Course Join Code 939018. Top Hat may require a paid subscription. A description of all subscription options can be found at www.tophat.com/pricing. The [Top Hat Overview website](#) describes how you to register for a Top Hat account and provides a brief overview to get you up and running on the system.

Software

Some in-class demonstrations will use the statistical computing environment, **R**. Students are *not* expected or required to use **R**, though some may find it useful to reproduce the in-class examples on their own. **R** is free. Versions for Windows, OS X, and Linux can be obtained at <http://cran.r-project.org/>.

Grading Scheme

Grades will be based on two in-class term tests, one *cumulative* final exam, and in-class participation. In-class participation marks will be based on responses (submitted primarily via the Top Hat system) to various questions proposed during the lectures. Exams will consist of multiple choice questions plus several short-answer and/or calculation questions. You may use a McMaster-approved calculator during the exams. Please bring your McMaster student ID card to each exam.

Course Assessment	% of Final Grade
Mid-term 1 (Oct 4)	27%
Mid-term 2 (Nov 15)	27%
Final Exam	40%
In-class Participation	6%

Missed Work Policy

If you are unable to attend or complete an in-class test, **students must review and follow** the guidelines described in *Requests for Relief for Missed Academic Term Work* in the Undergraduate Calendar. Those guidelines, as well as instructions for using the McMaster Student Absence Form (MSAF), can be found at <https://www.mcmaster.ca/msaf>. **Please note that there is no mechanism for missed in-class questions.**

Academic Integrity

Students are responsible for demonstrating behaviour that is honest and ethical in their academic work, and are expected to be familiar with the University's regulations regarding academic integrity. More generally, students are expected to conduct themselves in a manner that is consistent with McMaster University's policy on [Academic Integrity](#) and the [Code of Student Rights & Responsibilities](#).

Course Outline

The following schedule is approximate: Dates for specific lecture topics may change as we progress through the term, but every attempt will be made to keep the same dates for the in-class tests. Also, the exact reading assignments may be altered as we go through the term: please check the course website periodically. Students should try to complete the readings before the lectures. All readings refer to chapters in the course textbook. The term tests are scheduled for October 4 and November 15. There will be no class on October 21.

1. Week 1 (Sep 4 & 6): Basic Concepts & Graphical Displays
Reading: Chapters 1-3.
2. Week 2 (Sep 9, 11 & 13): Summarizing data: "typical" scores & variability
Reading: Chapters 4 & 5.
3. Week 3 (Sep 16, 18 & 20): Measuring the association between 2 variables: Correlation
Reading: Chapter 9
4. Week 4 (Sep 23, 25 & 27): Modelling the association between 2 variables: Linear regression
Reading: Chapter 10
5. Week 5 (Sep 30, Oct 2 & 4): **Review & in-class mid-term test (October 4)**
6. Week 6 (Oct 7, 9 & 11): How can we decide if data are unusual?
Reading: Chapters 6 & 8
7. Week 7 (Oct 14-18): **Mid-term recess. No Class.**
8. Week 8 (Oct 23 & 25): [No Class on Oct 21] Testing hypotheses & claiming discoveries: One-sample t tests
Reading: Chapter 12
9. Week 9 (Oct 28, 30 & Nov 1): Evaluating differences between two groups (2-sample t tests & statistical power)
Reading: Chapters 14 & 15
10. Week 10 (Nov 4, 6 & 8): Evaluating hypotheses about three or more groups (One-way ANOVA)
Reading: Chapter 16
11. Week 11 (Nov 11, 13 & 15): **Review & in-class mid-term test (November 15)**
12. Week 12 (Nov 18, 20 & 22): Evaluating hypotheses about combinations of variables (Factorial ANOVA)
Reading: Chapter 17
13. Week 13 (Nov 25, 27 & 29): Analysis of tabular data; Combining results across studies (Meta-Analysis)
Reading: Chapters 19 & 21
14. Week 14 (Dec 2 & 4): Dec 2: Is there a crisis in Psychological Science? Dec 4: Review