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

Instructor: Patrick Bennett  
office: PC-412  
email: bennett@mcmaster.ca  
office hour: Wednesday, 2:30-3:30 PM

Teaching Assistants: T.B.A.

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 materials for this course will be posted on Avenue to Learn. 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

Videotaped lectures and copies of the lecture slides will be posted on Avenue to Learn at the beginning of the term. The course also employ live meetings via Zoom (or some equivalent) on Tuesday, Wednesday, and Friday (12:30-1:20 PM) to review the posted lecture materials and discuss questions raised by students. Details of how to access the course materials and the live class meetings will be made available at the beginning of the term via Avenue to Learn.
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 course will use a free, on-line statistics textbook, Online Statistics Education, which is available at onlinestatbook.com.

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 cran.r-project.org.

Grading Scheme

Grades will be based on two term tests, one cumulative final exam, and in-class participation. In-class participation marks will be based on responses to various questions proposed during the lectures. Exams will consist of multiple choice questions and, perhaps, several short-answer and/or calculation questions.

<table>
<thead>
<tr>
<th>Course Assessment</th>
<th>% of Final Grade</th>
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</thead>
<tbody>
<tr>
<td>Mid-term 1 (Oct 9)</td>
<td>24%</td>
</tr>
<tr>
<td>Mid-term 2 (Nov 13)</td>
<td>24%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>47%</td>
</tr>
<tr>
<td>In-class Participation</td>
<td>5%</td>
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</tbody>
</table>

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 www.mcmaster.ca/msaf. Please note that there is no mechanism for addressing missed in-class questions.

McMaster University Statement on Inclusivity & Academic Integrity

The University values integrity, inclusiveness and teamwork, and strives to support the personal and collective growth of the McMaster student community. These values are foundational to ensuring campus environments – both in-person and virtual – are conducive to personal wellbeing and academic success.

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.
Inclusivity and a Culture of Respect

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning, and working communities. Expectations are described in Code of Student Rights & Responsibilities. It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue to Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students’ access to these platforms. Additional information about the Code and netiquette can be found here.

Course Outline

The following schedule is approximate. The reading assignments for each topic will be posted on Avenue to Learn at the beginning of the term. 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 tests are scheduled for October 9 & November 13.

1. Week 1 (Sep 8, 9, & 11): Basic Concepts & Graphical Displays
2. Week 2 (Sep 15, 16 & 18): Summarizing data: “typical” scores & variability
3. Week 3 (Sep 22, 23 & 25): Measuring the association between two variables: Correlation
4. Week 4 (Sep 29, 30 & Oct 2): Modelling the association between two variables: Linear regression
5. Week 5 (Oct 6, 7 & 9): Review & mid-term test 1 (October 9)
7. Week 7 (Oct 20, 21 & 23): Null-Hypothesis Significance Testing: How can we decide if data are unusual?
8. Week 8 (Oct 27, 28 & 30): Testing hypotheses & claiming discoveries: One-sample \( t \) tests
9. Week 9 (Nov 3, 4, & 6): Evaluating differences between two groups (2-sample \( t \) tests & statistical power)
11. Week 11 (Nov 17, 18 & 20): Evaluating hypotheses about three or more groups (One-way ANOVA)
12. Week 12 (Nov 24, 25 & 27): Evaluating hypotheses about combinations of variables (Factorial ANOVA)
13. Week 13 (Dec 1 & 3): The Replication “Crisis”
14. Week 14 (Dec 8 & 9): Review