

Faculty of Health
Department of Psychology
PSYC 2020 6.0 Section A: Statistical Methods I and II
Monday/11:30-2:30pm/Room – VH1152A
Fall-Winter/2023-2024

IMPORTANT INFORMATION ABOUT COURSE DELIVERY:

- This course will meet in-person **every Monday at 11:30am.**
- This course is delivered in a **flipped-classroom format.** This means that you will be asked to engage with course material before class. These materials may appear in various forms such as pre-recorded lectures, readings, links to websites with various tasks, etc. At minimum **you will be expected to watch the pre-recorded lectures before each class session.** For more information about the flipped classroom format click on [link](#).
- During the class session you will have the opportunity to ask any questions and engage in class activities. You will be provided with a form on eClass where you can submit questions anonymously in advance (I strongly recommend you send questions in advance but we will take other questions as well).

Instructor and T.A. Information

Instructor: Monique Herbert, PhD

Office Hours: By appointment only

Email: herbertm@yorku.ca (when sending an email please include PSYC2020A in the subject box and your full name and student number in the signature of the message)

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|---------------------|------------------|
| T.A. | Suzanne McKeag |
| Email | mckeags@yorku.ca |
| Office Hours | By appointment |

Please note that it may take the instructor and TA up to 3 business days to respond to your emails. If you send us an email over the weekend please do not expect a response until the normal work week (Monday – Friday) unless otherwise stated by a member of the teaching team or it is an urgent matter.

Course Prerequisite(s): None

Course Credit Exclusions

Please refer to [York Courses Website](#) for a listing of any course credit exclusions.

Course website: [eClass](#)

All course materials will be available on the course eClass site, unless otherwise indicated by the instructor. The site will be your central access point for course materials. **Note: Please do not send the teaching team messages through the chat on eClass.**

Course Description

An introduction to the analysis of data from psychological studies. Fundamental concepts and techniques of both descriptive and inferential statistics and their application to psychological research.

Program Learning Outcomes

Upon completion of this course, students should be able to:

1. Compute descriptive statistics and inferential statistics.
2. Interpret and report the results of descriptive statistics and inferential statistics.
3. Distinguish between the role of descriptive statistics and inferential statistics.
4. Compute inferential statistics for univariate linear models (ANOVA, regression).
5. Interpret and report the results of inferential statistics for univariate linear models.
6. Recognize the limits of inferential statistics.

Topics Covered

- Defining Key Statistical Terms
- Frequency Distributions
- Central Tendency
- Variability
- z-Scores/Normal Distribution
- Probability
- Sampling Distribution
- Confidence Intervals
- Power
- Effect Size
- Hypothesis Testing
- Correlation (Pearson at minimum)
- χ^2 Goodness of Fit
- χ^2 Test of Independence
- One-sample t test
- Independent samples t-test
- Dependent samples t-test
- Review of basic statistical concepts
- One-way Independent Groups ANOVA (with contrasts)
- Two-way Independent Groups ANOVA (with interaction and contrasts)
- One-way Repeated Measures ANOVA (with contrasts)
- Correlation (including partial correlation)
- Simple Regression

- Multiple Regression (optional)
- **Effect size is included as part of all inferential statistics covered in this course.*

Specific Learning Objectives

1. Choose descriptive statistics that are appropriate for summarizing and organizing variables with different scales of measurement
2. Demonstrate the ability to summarize, organize, and present the essential features of data numerically and graphically
3. Identify the differences between descriptive and inferential statistics (e.g., summarize sample data vs use sample data to make inferences about the population)
4. Identify limitations of descriptive statistics (e.g., cannot be used to test hypotheses about the population under study)
5. Demonstrate the ability to generate statistical hypotheses (i.e., null and alternative) that are applicable to various research situations
6. Demonstrate the ability to compute univariate inferential statistics and interpret and present the results for various research situations (i.e., t tests, ANOVAs)
7. Identify limits of conclusions based on inferential statistics (e.g., statistical vs practical significance)
8. Use statistical software to conduct descriptive and inferential statistics
9. Interpret and present results in APA

Required Text

There is no required text for this course. All materials and a list of resources to aid in your learning will be provided to you but see below for a list of recommended texts/resources you can consult.

Recommended text/resources

Gravetter, F. J., & Wallnau, L. B. *Statistics for the behavioral sciences*. Wadsworth Publishing, Cengage Learning. (8th -10th edition would be useful)

Howell, D. C. (2016). *Fundamental statistics for the behavioral sciences* (9th ed). Wadsworth Publishing, Cengage Learning.

<https://open.umn.edu/opentextbooks/textbooks/an-introduction-to-psychological-statistics>

APA resource:

https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/reference_list_books.html

Course Requirements and Assessment:

| Assessment | Date of Evaluation (if known) | Weighting |
|---------------|--|-------------|
| Participation | Course activities, surveys & iClicker | 5% |
| Stats Checks | Sep20, Oct04, Oct25, Nov08, Nov22, Jan17, Jan31, Mar06 | 24% |
| Quiz 1 | Oct 16 | 6% |
| Quiz 2 | Nov 27 | 6% |
| Quiz 3 | Feb 12 | 6% |
| Quiz 4 | Mar 25 | 6% |
| Assignment 1 | Dec 04 | 22% |
| Assignment 2 | Apr 01 | 25% |
| Total | | 100% |

Description of Assignments

Participation: You will have the opportunity to gain **5%** for participating in various activities throughout the course such as completing feedback surveys related to course information (e.g., course outline), responding to iClicker questions during our weekly class meeting or outside of our weekly class meeting etc. Look out for the various activities you will need to complete.

Please note the Course Outline Survey is mandatory and accounts for 1% of the overall 5% for participation. See **“Class Participation”** folder on eClass for more information on how to download and install iClicker.

Stats Check: Approximately every two weeks students will complete an activity that covers material taught within a two week period. **This activity will be completed outside the normal class meeting time and students can work individually or in groups of 2.** The activity may take the form of a scenario where students will be asked to read some information and then respond to a question(s) – students will need to use course materials and other resources to respond. These activities will be made available in the **“Stats Checks and Quizzes”** folder in eClass on the assigned dates provided in the **“Course Schedule”** below and you will receive them in advance of the due date.

Quizzes: Quizzes will be non-cumulative and cover the material from lectures, readings, and class & stats check activities. The format of the quizzes may be a mix of multiple-choice and open-ended/short-answer questions (e.g., defining concepts or responses to analysis questions). **Quizzes will take place during the assigned class time: 11:30am-2:30pm.** More information about the content, format and length of the quiz will be provided prior to its administration and you can access a quiz in the **“Stats Checks and Quizzes”** folder in eClass.

Assignments: The purpose of an assignment is to further evaluate your conceptual understanding of the material covered in class, to demonstrate that you can perform the types of analysis covered in this course and that you can interpret/report the results. **Assignments will be completed outside the normal class time and students are expected to complete their assignment individually.** More information will be provided in the **“Assignment Instruction and Submission”** folder in eClass and you will receive each assignment in advance of the due date.

Class Format and Attendance Policy

Course concepts will be delivered to students through pre-recorded lectures posted on the eClass course site. Additional information related to application of the course concepts will be delivered in person. In-person classes will include Q&A about course concepts and any other course-related questions, iClicker/learning activities to review, reinforce, and practice content facilitated by the teaching team (i.e., instructors and TAs).

To make the most of the learning experience it is expected that students watch the pre-recorded lectures at minimum corresponding to the particular week's concept(s) covered. If a student is unable to make the in-person portion of a class it is the student's responsibility to review the relevant materials and activities and if needed, reach out to the teaching team for support.

Grading as per Senate Policy

The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York (e.g., A+ = 9, A = 8, B+ = 7, C+ = 5, etc.). Assignments and tests* will bear either a letter grade designation or a corresponding number grade (e.g. A+ = 90 to 100, A = 80 to 89, B+ = 75 to 79, etc.)

For a full description of York grading system see the York University Undergraduate Calendar – [Grading Scheme for 2023-24](#)

Missed Tests/Midterm Exams/Late Assignment

For any missed or late class assessment students **MUST** complete the **“Missed Assessment Form”** under the **“Communication”** folder in eClass.

Failure to complete the form within 48 hours of the original deadline will result in a grade of zero for any missed or late assessment. **At this time, due to COVID-19 an Attending Physician's Statement (APS) is not required, however, a reason for a missed/late assessment in the course must be provided.**

Missed Quiz: Once you have notified us about your missed quiz, a member of the teaching team will be in contact with you to schedule a make-up. There is only one opportunity to write a make-up quiz; the makeup may be in a different form from the original test. If you do not contact us or complete the form within 48 hours you will be assigned a 0. **Please note that a stats check or an assignment cannot be used as a substitute for a missed quiz.**

Late Stats Check/Assignment: Similar to your quizzes you must have a valid reason for missing the scheduled due date for your stats check or assignment. It is up to the course instructor to determine how much additional time, if any, will be allowed to complete and submit the stats check/assignment. **Please note that a quiz cannot be used as a substitute for a stats check or assignment and a stats check cannot be used as a substitute for an assignment or vice versa.**

Add/Drop Deadlines

For a list of all important dates please refer to [Undergraduate Fall/Winter 2023-2024 Important Dates](#)

| | Fall (Term F) | Year (Term Y) | Winter (Term W) |
|---|-------------------------|---------------------|-------------------|
| Last date to add a course without permission of instructor (also see Financial Deadlines) | September 20 | September 20 | January 22 |
| Last date to add a course with permission of instructor (also see Financial Deadlines) | September 28 | September 28 | January 31 |
| Drop deadline: Last date to drop a course without receiving a grade (also see Financial Deadlines) | November 8 | February 8 | March 11 |
| Course Withdrawal Period (withdraw from a course and receive a grade of "W" on transcript – see note below) | November 9 – December 5 | February 9- April 8 | March 12- April 8 |

Add and Drop Deadline Information

There are deadlines for adding and dropping courses, both academic and financial. Since, for the most part, the dates are **different**, be sure to read the information carefully so that you understand the differences between the sessional dates below and the [Refund Tables](#).

You are strongly advised to pay close attention to the "Last date to enrol without permission of course instructor" deadlines. These deadlines represent the last date students have unrestricted access to the registration and enrolment system.

After that date, you must contact the professor/department offering the course to arrange permission.

You can drop courses using the registration and enrolment system up until the last date to drop a course without receiving a grade (drop deadline).

You may [withdraw from a course](#) using the registration and enrolment system after the drop deadline until the last day of class for the term associated with the course. When you withdraw from a course, the course remains on your transcript without a grade and is notated as 'W'. The withdrawal will not affect your grade point average or count towards the credits required for your degree.

Electronic Device Policy

It is expected that students will have a laptop or other device during in-person sessions to complete class activities using statistical software. If you do not have your own device you can pair-up with another student to facilitate your learning.

Use of electronic devices to share information in any form (e.g., screenshots) about personal feedback received on submitted work or work related to course assessments will be considered a violation of the electronic policy. Unauthorized sharing of these details and/or other course materials in any way (e.g., WhatsApp group, Reddit, Discord, etc.) is strictly prohibited.

Academic Integrity for Students

York University takes academic integrity very seriously; please familiarize yourself with [Information about the Senate Policy on Academic Honesty](#).

It is recommended that you review Academic Integrity by completing the [Academic Integrity Tutorial](#) and [Academic Honesty Quiz](#)

Test Banks

The offering for sale of, buying of, and attempting to sell or buy test banks (banks of test questions and/or answers), or any course specific test questions/answers is not permitted in the Faculty of Health. Any student found to be doing this may be considered to have breached the Senate Policy on Academic Honesty. In particular, buying and attempting to sell banks of test questions and/or answers may be considered as “Cheating in an attempt to gain an improper advantage in an academic evaluation” (article 2.1.1 from the Senate Policy) and/or “encouraging, enabling or causing others” (article 2.1.10 from the Senate Policy) to cheat.

Academic Accommodation for Students with Disabilities

While all individuals are expected to satisfy the requirements of their program of study and to aspire to do so at a level of excellence, the university recognizes that persons with disabilities may require reasonable accommodation to enable them to do so. The university encourages students with disabilities to register with Student Accessibility Services (SAS) to discuss their accommodation needs as early as possible in the term to establish the recommended academic accommodations that will be communicated to Course Directors as necessary. Please let me know as early as possible in the term if you anticipate requiring academic accommodation so that we can discuss how to consider your accommodation needs within the context of this course.

<https://accessibility.students.yorku.ca/>

Excerpt from Senate Policy on Academic Accommodation for Students with Disabilities

1. Pursuant to its commitment to sustaining an inclusive, equitable community in which all members are treated with respect and dignity, and consistent with applicable accessibility legislation, York University shall make reasonable and appropriate accommodations in order to promote the ability of students with disabilities to fulfill the academic requirements of their programs. This policy aims to eliminate systemic barriers to participation in academic activities by students with disabilities.

All students are expected to satisfy the essential learning outcomes of courses. Accommodations shall be consistent with, support and preserve the academic integrity of the curriculum and the academic standards of courses and programs. For further information please refer to: [York University Academic Accommodation for Students with Disabilities Policy](#).

Course Materials Copyright Information

These course materials are designed for use as part of the **PSYC2020A** course at York University and are the property of the instructor unless otherwise stated. Third party copyrighted

materials (such as book chapters, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law.

Copying this material for distribution (e.g. uploading material to a commercial third-party website) may lead to a violation of Copyright law. [Intellectual Property Rights Statement](#).

Course Schedule

| Week | Date | Topic | Reminder |
|-------------|-------------|--|--|
| | | SEMESTER I | |
| 1 | Sep 11 | <i>Course Overview</i> <i>Introduction to jamovi</i> | |
| 2 | Sep 18 | <i>Introduction to Statistics</i> | Stats Check 1 due Wednesday, Sep 20 |
| 3 | Sep 25 | <i>Examining Data: Tables and Figures</i> | |
| 4 | Oct 02 | <i>Measures of Central Tendency & Variability</i> | Stats Check 2 due Wednesday, Oct 04 |
| | Oct 09 | FALL Reading Week - NO CLASS | |
| 5 | Oct 16 | Quiz 1 | |
| 6 | Oct 23 | <i>z-Scores: Location of Scores and Standardized Distributions</i> <i>Normal Distribution</i> | Stats Check 3 due Wednesday, Oct 25 |
| 7 | Oct 30 | <i>Probability and Introduction to Hypothesis Testing</i> | |
| 8 | Nov 06 | <i>Errors in Hypothesis Testing, Statistical Power, and Effect Size</i> | Stats Check 4 due Wednesday, Nov 08 |
| 9 | Nov 13 | <i>Testing One Sample Mean</i> <i>Estimating the Mean of a Population</i> | |
| 10 | Nov 20 | <i>Testing the Difference Between Two Means</i> | Stats Check 5 due Wednesday, Nov 22 |
| 11 | Nov 27 | Quiz 2 | |
| 12 | Dec 04 | Q&A and Semester I Wrap-Up | Assignment 1 due |
| | | SEMESTER II | |
| 1 | Jan 08 | <i>Semester I: Review of Key Concepts</i> | |
| 2 | Jan 15 | <i>One-Way Analysis of Variance</i> | Stats Check 6 due Wednesday, Jan 17 |

| Week | Date | Topic | Reminder |
|-------------|-------------|---|--|
| 3 | Jan 22 | <i>Two-Way Analysis of Variance</i> | |
| 4 | Jan 29 | <i>Repeated Measures Analysis of Variance</i> | Stats Check 7 due Wednesday, Jan 31 |
| 5 | Feb 05 | <i>More on Analysis of Variance</i> | |
| | Feb 08 | Last date to drop a course without receiving a grade | |
| 6 | Feb 12 | Quiz 3 | |
| | Feb 19 | Winter Reading Week - NO CLASS | |
| 7 | Feb 26 | <i>Chi-Square</i> | |
| 8 | Mar 04 | <i>Correlation</i> | Stats Check 8 Wednesday, Mar 06 |
| 9 | Mar 11 | <i>Linear Regression – Part 1</i> | |
| 10 | Mar 18 | <i>Linear Regression – Part 2</i> | |
| 11 | Mar 25 | Quiz 4 | |
| 12 | Apr 01 | Q&A and Semester II Wrap-Up | Assignment 2 due |