

Faculty of Health
Department of Psychology
PSYC 2020 6.0 Section B: STATISTICAL METHODS I AND II
Monday /2:30–5:30pm /SLH C
Fall-Winter /2019-20

Instructor and T.A. Information

Instructor: Ji Yeh Choi, PhD

Office: BSB 331

Office Hours: T 3:30 – 4:30 pm or by appointment

Email: jychoi@yorku.ca Be sure to include **PSYC2020** in the subject line.

T.A.	Naomi Martinez Gutierrez
Email	naomimg@yorku.ca
Office	BSB 072F
Office Hours	M 1:30 – 2:30pm

Course Prerequisite(s): Course prerequisites or co-requisite are strictly enforced

- HH/PSYC 1010 6.00 (Introduction to Psychology), with a minimum grade of C.

Course Credit Exclusions

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

Course website: [Moodle](#)

Course Description

Statistics are central to research in many fields of social sciences, including psychology. This course will introduce the basic concepts of statistical methods for the analysis of data obtained from experimental designs and other research studies. The course is hands-on, methodologically oriented. The course does not emphasize mathematics; there will be some calculations involved, but these require nothing more than elementary algebra. Instead, the focus will be on gaining a greater **understanding of the statistical methods** used by researchers in the social sciences, in addition to the appropriate use and interpretation of statistical results.

Note: When sending an email, please include **PSYC2020** in the subject line and your full name and student number in the signature of the message.

Calculator: You will need a calculator in class and exams (including the final), but calculators may not be programmable or capable of storing text.

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
- Two independent samples t-test
- Paired 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
- **Effect size is included as part of all inferential statistics covered in this course.*

Specific Learning Objectives

1. Identify 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. Demonstrate the ability to generate statistical hypotheses (i.e., null and alternative) that are applicable to various research situations

5. Identify the various research designs that address different types of questions and hypotheses.
6. Articulate strength and limitations of various research designs.
7. Demonstrate the ability to perform the correct statistical analysis procedures, either by hand (for basic statistics) or using a computer software program.
8. Draw conclusions and write up the results in APA style based on the analysis.

Recommended Text

Gravetter, F. J., & Wallnau, L. B. (2014). *Statistics for the Behavioral Sciences* (10th ed.).

There are **no** textbooks required for the course. Nonetheless, the listed book above will be useful to facilitate an understanding of many topics/problems discussed in the class. The book is available at the bookstore or in e-copy at <https://www.nelsonbrain.com/shop/ProductDisplay?langId=1&storeId=10651&catalogId=10052&productId=735414>

Course Requirements and Assessment:

Assessment	Date of Evaluation (if known)	Weighting
Assignment #1	Nov 18	10%
Assignment #2	Jan 27	10%
Test #1	Oct 21	15%
Test #2	Dec 02	15%
Test #3	Feb 10	15%
Final Exam	Apr 7-25	35%
Total		100%

Description of Assignments

Individual Assignments: There will be two individual assignments (Nov 18 and Jan 27) each of which worth 10%. They will consist mainly of short problems. **Assignments must be done independently.** Students are required to submit all assignments at the beginning of each class on assignment due date. No electronic submission of assignments will be permitted. Incomplete and late submissions will be penalized, and submissions more than one day late will not be accepted.

Tests/Final exam: There will be three in-class tests and a final exam. As the nature of statistics is cumulative, the tests/exam will be as well. However, there will be a focus on the most recently learned materials. They will cover the materials from lectures, readings, and assignments. There will be some calculations required, so you will be permitted to use a calculator (Note that electronic devices other than a simple calculator will not be an acceptable replacement). The format of the tests will be a mix of multiple-choice and short-answer questions. For short-answer questions, all work must be shown for evaluation.

Tests: For the dates, please refer to the course schedule below.

Final Exam: The time and location will be announced in due course.

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 2019-20](#)

Missed Tests/Midterm Exams/Late Assignment:

For any missed tests, midterm exam or late assignments, students **MUST** complete the following online form which will be received and reviewed in the Psychology undergraduate office.

[HH PSYC: Missed Tests/Exams Form](#). Failure to complete the form within 48 hours of the original deadline will result in a grade of zero for the missed tests, midterm exam or late assignments.

In addition, to the online form, students documented reason for a missed tests, midterm exam or late assignments such as illness, compassionate grounds, etc., **MUST** submit official documentation (e.g. [Attending Physician Statement](#))

Upon completion of the online form and after receipt of your supporting documentation you will have two options:

- (1) **one opportunity** to write a make-up test (this will be scheduled at a day and time to be announced by the instructor and may take a different form from the original test)**
- OR**
- (2) opt to have the weight of the missed test added to your cumulative final exam

****Note: Option 2 will take immediate effect provided the appropriate notification and documentation were received.**

Missed Final Exam: If you miss your final exam please also complete the online form **within 48 hours of the missed exam** and provide formal documentation (i.e., Attending Physician Statement and Final Exam Deferred Standing Agreement Form) **within 7 days of the missed final exam.**

Add/Drop Deadlines

For a list of all important dates please refer to: [Fall/Winter 2019-20 - Important Dates](#)

	FALL (F)	YEAR (Y)	WINTER (W)
Last date to add a course without permission of instructor (also see Financial Deadlines)	Sept. 17	Sept. 17	Jan. 19
Last date to add a course with permission of instructor (also see Financial Deadlines)	Oct. 1	Oct. 22	Feb. 3
Drop deadline: Last date to drop a course without receiving a grade (also see Financial Deadlines)	Nov. 8	Feb. 3	March 13

Course Withdrawal Period (withdraw from a course and receive a grade of “W” on transcript – see note below)	Nov. 9 - Dec. 3	Feb. 4 - Apr. 5	March 14 - Apr. 5
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***Note:** *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.*

Information on Plagiarism Detection

Turnitin will be used to detect any evidence of plagiarism.

Electronic Device Policy

In class, students can use an electronic device (e.g., tablets, laptops) for course-related purposes.

Electronic mobile devices of any kind are not allowed during a test or examination. Students are required to turn off and secure any electronic mobile device in their bag which is to be placed under the chair while a test/exam is in progress. Any student observed with an electronic device during a test/exam may be reported to the Undergraduate Office for a potential breach of Academic Honesty.

Attendance Policy

Students are expected to attend all classes as weekly class activities builds on the previous week’s material.

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 information [SPARK Academic Integrity modules](#). These modules explain principles of academic honesty.

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.

Electronic Devices During a Test/Examination

Electronic mobile devices of any kind are not allowed during a test or examination. Students are required to turn off and secure any electronic mobile device in their bag which is to be placed under the chair while a test/exam is in progress. Any student observed with an

electronic device during a test/exam may be reported to the Undergraduate Office for a potential breach of Academic Honesty.

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 [York University Accessibility Hub](#) is your online stop for accessibility on campus. The [Accessibility Hub](#) provides tools, assistance and resources. Policy Statement.

Policy: York University shall make reasonable and appropriate accommodations and adaptations in order to promote the ability of students with disabilities to fulfill the academic requirements of their programs.

The nature and extent of accommodations shall be consistent with and supportive of the integrity of the curriculum and of the academic standards of programs or courses. Provided that students have given sufficient notice about their accommodation needs, instructors shall take reasonable steps to accommodate these needs in a manner consistent with the guidelines established hereunder.

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 **PSYC 2020B** 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

Fall Semester				
Session	Date	Topic	Reading (Text Chapter)	Assignment Due
01	Sep 9	Course Overview Definitions Frequency Distributions	1, 2, Appendix A	
02	Sep 16	Descriptive statistics	3, 4	
03	Sep 23	Covariance, Correlation and Simple Regression	15, 16	
04	Sep 30	Probability Probability Distribution	6, 7	
05	Oct 7	Normal Distribution Computation of Z-score	5	
	Oct 14	Reading Week – No class		
06	Oct 21	Test #1		
07	Oct 28	Logic of Statistical Inference	8	
08	Nov 4	Introduction to the T-statistic	9	
09	Nov 11	T-tests I	10	
10	Nov 18	T-tests II	11	Assignment #1
11	Nov 25	Chi-square Statistics Semester Review	17	
12	Dec 2	Test #2		
Winter Semester				
01	Jan 6	Review of Semester I		
02	Jan 13	One-way ANOVA I	12	
03	Jan 20	One-way ANOVA II	12	
04	Jan 27	Two-way ANOVA	14	Assignment #2
05	Feb 3	ANOVA - Repeated Measures	13	
06	Feb 10	Test #3		
	Feb 17	Reading Week – No class		
07	Feb 24	Three-factors Experimental Design	14	
08	Mar 2	Non-parametric Statistics	Appendix E	
09	Mar 9	Multiple Regression I	16	
10	Mar 16	Multiple Regression II	16	
11	Mar 23	ANCOVA		
12	Mar 30	Overall Course Review		
	Apr 7-25	Final Examination		

** Note: This lecture schedule is subject to change as needed during the semester.