

PSYCHOLOGY DEPARTMENT

Course: AK/AS/SC PSYC 2022 3.0A – Statistical Methods II

Day/Time: Online via Zoom

Course Webpage: This course uses eClass/Moodle and Zoom

Term: Fall Term 2021

Prerequisite / Co-requisite: Course prerequisites are strictly enforced.

- HH/PSYC 2021 3.00 (Statistical Methods I)
- **Course Prerequisite or corequisite(s):**
- HH/PSYC 1010 6.00 (Introduction to Psychology), with a minimum grade of C when used as a prerequisite

Course Instructor & TA's

Instructor: Ed Haltrecht haltrech@yorku.ca

TA's Students with last names starting from A – K John Kim johnk84@my.yorku.ca
 Students with last names starting from L – Z Elizabeth Wanstall Ewanst@my.yorku.ca

Course Credit Exclusions

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

Course website: [eClass/Moodle](#)

Time and Location

Audio-visual Lectures available on eClass/MOODLE prior to live sessions on ZOOM

Online active support Mon 2:30 – 5:30pm

Please note that this is a course that depends on remote teaching and learning. There will be no activities on campus.

Organization of the Online Course

1. We will hold 9 “lectures” where we present new material. Think about these as “classes”. All of this will be available in eClass/Moodle.
2. A pre-recorded PowerPoint (audio and visual) lecture will be uploaded to eClass/Moodle about a week before each class. These pre-recordings will be about 40 minutes each- and you can start/stop/pause them at your own speed at any time. You need eClass/Moodle access for this element of the course, on a device that allows you to see and hear the PowerPoint material. But you do not need to have the PowerPoint software program on your device.
3. We will also hold a live Zoom “drop-in” session that is optional and will be recorded for your viewing at any time. The session will be on the date and time allocated for the course (Mon from 2:30 – 5:30 pm – see schedule later in this course outline). The purpose of these Zoom sessions is to quickly review the key elements that were detailed in the eClass/Moodle PowerPoint “lectures” that you had available prior to this Zoom live session. During the Zoom session, your mics will be muted, but you can use the Zoom Chat feature to ask questions. We had to mute your mics because we

have about 200 students in the course and it will be chaotic if everyone wants to talk at once.

4. Our TA's may hold additional Zoom sessions to help students who are struggling with some of the course material. These additional Zoom sessions will be announced on eClass/Moodle including sending you an email. We may also post additional PowerPoint material if required.
5. This course is divided into 9 main topic areas – which follow closely to the 10 chapters that we will cover in our text. (Some topics include 2 chapters).
6. There will be 3 tests worth 25%; 25%, and 20% each, plus an assignment worth 30% due after the course ends. The tests will be non-cumulative. The schedule presented later in this course outline lists the timing and content of the tests.

Technical requirements for taking the course:

1. Students will need equipment to gain access to eClass/Moodle.
2. Students will also need access to Zoom for video conferencing during tutorial sessions.
3. In addition to stable, higher-speed Internet connection, students will need a computer with webcam and microphone, and/or a smart device with these features.

A way to determine Internet connection and speed: there are online tests, such as Speedtest, that can be run.

Useful links describing computing information, resources and help for students:

[Student Guide to eClass/Moodle](#)

[Zoom@YorkU Best Practices](#)

[Zoom@YorkU User Reference Guide](#)

[Computing for Students Website](#)

[Student Guide to eLearning at York University](#)

Course Description

Program Learning Outcomes

Course Description

This course builds on material presented in Statistical Methods I. Students will gain a greater understanding of the statistical procedures used by researchers in the behavioural sciences, in addition to the appropriate use and interpretation of statistical results. Topics that will be covered include: hypothesis tests using t-tests (for independent and related measures); Analysis of variance (ANOVA) for repeated measures, independent measures and two factors; multiple comparison procedures (post-hoc analysis), correlation and prediction, and non-parametric techniques. Students should be able to identify the correct statistical test to use. Mathematical competency gained from PSYC2021 is expected- see Appendix A in the text for a Basic Mathematics Review.

Program Learning Outcomes

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

1. Compute inferential statistics for univariate linear models (ANOVA, regression).
2. Interpret and report the results of inferential statistics for univariate linear models.
3. Recognize the limits of inferential statistics.

Topics Covered

- Review of basic statistical concepts and review of z and t-tests.
- One-way Independent Groups ANOVA (with contrasts)
- Two-way Independent Groups ANOVA (with interaction and contrasts)
- One-way Repeated Measures ANOVA (with contrasts)
- Correlation (Pearson and Spearman).
- Non-parametric tests
- Simple Regression
- Multiple Regression

*Effect size is included as part of all inferential statistics covered in this course.

Course Schedule

DATE	TOPIC	TEXT CHAPTER
Sept 13	Intro to course; review of hypothesis testing, z-test, effect size, power, single sample t-test	8, 9
Sept 20	t-test for Two Independent Samples; t-test for Two Related Samples	10, 11
Sept 27	TEST 1 (Worth 25%-covers Sept 13 – 20 Topics) no Zoom Class	
Oct 4	ANOVA - introduction and Single Factor Independent Measure Design	12
Oct 11	Thanksgiving – No Classes	
Oct 18	ANOVA - Repeated Measures	13
Oct 25	ANOVA – Two-Factor (Independent Measures)	14
Nov 1	TEST 2 (Worth 25%-covers Oct 4 - 25 Topics) no Zoom Class	
Nov 8	Correlation (Pearson and Spearman)	15
Nov 15	Regression – Equations and Analysis of Regression; Multiple Regression	16
Nov 22	Non-parametric tests (Mann-Whitney; Wilcoxon)	Appendix E1,2,3
Nov 29	TEST 3 (Worth 20%-covers Nov 8 -22 Topics) no Zoom Class	
Dec 6	Choosing the right statistics	
Dec 20	Assignment Due (Worth 30%) – Based on the Dec 6 topic. Electronic submission to TA's.	

Description of Assignment – Due Dec 20

Overview

Submit a single word-processed document using appropriate word-processing software (e.g., Word, LibreOffice, L^AT_EX, R Markdown). Embed all images in the document. Please submit the document in .doc, .docx, .odt, or .pdf file format (.pdf is preferred). Submit the document using the *Final Assignment* submission portal on the course eClass page. All data required to complete the assignment are available in text format throughout this document. To aid students who opt to use statistical software, all the text-formatted data in this document have been duplicated into a series of .csv files also located in the Final Assignment folder. Each .csv file is intuitively labeled according to the Long Answer question for which it is intended (e.g., file “Q1.csv” contains the data for Long Answer question 1).

Scenarios

For these questions, you are given brief summaries of research scenarios, specific hypotheses, and accompanying data. You are required to conduct appropriate statistical analyses of the data to draw conclusions for each research hypothesis. Write a brief report of the results in which you

- Highlight all inferential statistical effects (e.g., There was a strong main effect of Factor A)
- Discuss the qualitative nature of any such effects (e.g., Group A scored higher on <dependent variable> than group B)
- Report the results of your statistical tests using the appropriate APA formatting for each respective statistical test (e.g., $t[12] = 2.53$, $p = .026$, $d = 0.74$, 95% CI = [1.34, 4.78])
- Refer back to the research scenario to make a broad declarative statement about how well the research hypothesis is supported

You are free to use statistical software (e.g., SPSS, SAS, R, sciPy, MATLAB) to conduct statistical analyses and construct data plots. However, you must provide screenshots of your output as part of your submission. Please embed these images in the word-processed document, rather than submitting them separately. If you would prefer to compute statistical tests and construct data plots by hand on paper, please take photos of your work and embed them into your submission in much the same manner. Alternatively, you could type out your hand calculations, but this would likely be rather tedious and we therefore advise against it.

If you opt to use statistical software, please report exact p values for each statistical test (e.g., $p = .026$). Otherwise, if you perform hand calculations, report p values in relation to (e.g., less than) the appropriate α -level (e.g., $\alpha = .05$) and include the critical values from the relevant statistical tables provided in the textbook for each statistical test (e.g., $p < .05$; $t_{crit} = 2.18$).

COURSE MATERIALS REQUIRED (Book, MindTap online resource)

Three Course Text Options (PICK ONLY 1 OPTION).

Below are the purchasing options for students. Options are available through the York bookstore. If an option you want is not available on the York site, try the Cengage site. The text for the course is Gravetter & Wallnau’s *Statistics for the Behavioral Sciences* 10th edition. The text publisher also has available an online system called MindTap. It is an aid and contains many problems that you can work on. MindTap is not mandatory for the course.

MindTap was designed to work with the same author's text called the Essentials of Statistics. You do not want to buy that Essentials book, but MindTap associated with that book is really good. In a nutshell, your recommended options are to buy a printed copy of the 10th edition (available as a text or looseleaf edition) or an electronic edition of the 10th edition. You may also want to obtain an electronic version of the online Essentials MindTap resource. You can likely also do well in the course with the 9th edition if you can get it as a used text. The texts only give half of the answers at the back of the book. While the lectures are based on the 10th edition, we will put on eClass the answers for the problems at the end of the chapters for both the 9th and 10th editions.

Option #1 – bundle of: loose-leaf version of the Gravetter 10th ed Stats text + CUSTOM CHAPTER + MindTap Printed Access Card (12 month access)

Package ISBN: 0176882480

Price: \$125.95

Option #2 – bundle of: Statistics for the Behavioral Sciences 10th edition text + CUSTOM CHAPTER + MINDTAP Printed Access Card (12 month access)

Package ISBN: 9780176853020

Price: \$180.95

Option #3 – paperless option - MindTap printed access card (includes e-book) for Gravetter Stats for The Behavioral Sciences, 10th Ed (12 month access). Please ask at the bookstore for this option.

ISBN: 9781337280754

Price: \$99.95

The bookstore is open ONLINE only and will ship texts to students with NO shipping fee. Bookstore web site: <https://www.bookstore.yorku.ca/>

If students already have a used text, all they need is Option #3 – the MindTap access card, which they can purchase through the bookstore web site. The bookstore will email them with an access code.

If students just buy access to MindTap, they may be wondering about the custom chapter. This chapter contains statistical tests that are used in the second stats course (PSYC 2022) so it's not needed right now. Students can buy this chapter at the bookstore for \$9.95.

MindTap gives students access for three course attempts, which means that a student could withdraw from this course and take it again at a later date and still have access to MindTap. The courses don't have to be consecutive – students could take the course now, withdraw, and then take it again in September 2022.

Course Enrolment

Last date to enrol without permission of course instructor – Sept 21

Last date to enrol with permission of course instructor – Oct 5

Last date to drop courses without receiving a grade – Nov 12

Course Withdrawal Period (withdraw from a course and receive a grade of "W" on transcript –

see note below) Nov 13 – Dec 7

**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.*

The course instructor and TA's do not get involved in enrolment issues - see department administration.

Evaluation

Three tests worth 25% each, and an assignment worth 25%. See above schedule for dates.

Missed Classes and other matters

We do not take attendance. Please contact your TA for on-line appointments in case you are having any difficulties in understanding the material.

Grading

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.). Tests will bear either a letter grade designation or a corresponding number grade (e.g. A+ = 90 to 100, A = 80 to 90, B+ = 75 to 79, etc.)

Missed Tests: Students are expected to write each test on the dates specified.

ETHICS AND LEGAL OBLIGATIONS

All students are expected to familiarize themselves with the following information, available on the Senate Committee on Academic Standards, Curriculum & Pedagogy webpage (see Reports, Initiatives, Documents) -

<http://www.yorku.ca/secretariat/senate/committees/ascp/index-ascp.html>

- Senate Policy on Academic Honesty and the Academic Integrity Website
- Ethics Review Process for research involving human participants
- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
- Student Conduct Standards
- Religious Observance Accommodation

Audio-visual recordings – both on eClass/Moodle and Zoom: 1) the recordings should be used for educational purposes only and as a means for enhancing accessibility; 2) students do not have permission to duplicate, copy and/or distribute the recordings outside of the class (these acts can violate not only copyright laws but also FIPPA and intellectual property rights); and 3) all recordings will be destroyed after the end of classes. Please see the Teaching commons going remote website particularly the section on Copyright and intellectual property at <https://bold.info.yorku.ca/> and <https://copyright.info.yorku.ca/students-reuse-of-teaching-materials-from-york-courses-2/> for some statements to use in your course outline about intellectual property.

1) Information about Academic Resources

Textbooks: See notes in this outline and on eClass/Moodle.

Digital content: York University Libraries also has access to online content that can be linked (using permalinks) through eClass/Moodle. A Library guide on creating permalinks/stable links to articles/ebooks/electronic resources can be found in various databases/Omni (the new library catalogue) at <https://researchguides.library.yorku.ca/permalinks> -- that can be used in eClass/Moodle. When students click on the stable link, they will be asked to authenticate through Passport York and then they have full access to the online resource. Using these permalinks addresses copyright issues.

2) Information about Academic honesty and integrity

Please see the library resources, academic integrity, and copyright section of the Going Remote website at <https://bold.info.yorku.ca/>

In this course, we strive to maintain academic integrity to the highest extent possible. Please familiarize yourself with the meaning of academic integrity by completing SPARK's Academic Integrity module at the beginning of the course. Breaches of academic integrity range from cheating (i.e., the improper crediting of another's work, the representation of another's ideas as your own, etc.) to aiding and abetting (helping someone else to cheat). All breaches in this course will be reported to the appropriate university authorities, and can be punishable according to the Senate Policy on 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.

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/>

Electronic Device Policy

This course will be delivered in an online format and therefore electronic devices (e.g., tablets, laptops) as permitted during class time for course-related purposes. It is expected that you would complete tests/exams in a manner that does not require consulting an unauthorised source during an examination.