

PSYC*6060, Course Outline: Fall 2018**General Information**

Course Title: Research Design and Statistics

Course Description:

This course covers significance testing and effect-size estimation using non-parametric and parametric techniques. Topics include meta-analysis, multiple regression/correlation, and analysis of variance. Current controversial issues are presented.

Credit Weight: 0.50

Academic Department (or campus): Psychology

Semester Offering: F18

Class Schedule and Location:

Lecture: Tuesday, 8:30am – 11:20am, MCKN 317

Lab: Wednesday, 9:30am – 10:20am, ALEX 309

Office Hours: TBA

Instructor Information

Instructor name: David Stanley

Instructor email: 6060guelph@gmail.com

Office location and office hours: TBA

GTA Information

GTA Name: TBA

GTA Email: TBA

Course Content

Specific Learning Outcomes:

1. Understand and apply advanced concepts in statistics to data analysis in psychology.
2. Understanding of the reasons for open science and ability to engage in open science practices.
3. Know how to write hypotheses, analyses, and set sample sizes.
4. Show an ability to analyze and interpret data to test a claim.
5. Demonstrate a skill set with statistical analysis software.
6. Evaluate the nature and extent of graphs needed to support analyses.
7. Evaluate the graphs associated with analyses.
8. Write with appropriate vocabulary, APA style adherence, and few grammatical or functional errors.
9. Writes in a sophisticated manner clearly conveying the message of the writer to a target audience.
10. Locate and use information about R from a variety of resources and formats including books, R help files, Google searches, etc.

Lecture Content:

A partial list of readings is presented below. Additions may be emailed to you. The list below represents a sequential order. On occasion we may pause the schedule to allow for catchup, project work, and additional learning about R.

There will not be a lecture on Tuesday Nov. 20th. This will be a catchup day for projects and final exam preparation.

Readings Week 1: Replication Crisis and Introduction to R

Chambers (2017): Chapter 1

Cumming & Calin-Jageman (2016): Chapters 1 to 2 (review, you should know this already)

[POST QUIZ IN CLASS VIDEO 1: <https://www.youtube.com/watch?v=0Rnq1NpHdmw>]

[POST QUIZ IN CLASS VIDEO 2: <https://www.youtube.com/watch?v=42QuXLuCH3Q&feature=youtu.be>]

Also: [Guelph Thesis Statistics Guidelines](#)

Readings Week 2: Introduction to R continued

Chambers (2017): Chapter 2

Cumming & Calin-Jageman (2016): Chapters 3 to 4 (review, you should know this already)

Readings Week 3: NHST, p-values, confidence intervals, effect size

Chambers (2017): Chapter 3

Cumming & Calin-Jageman (2016): Chapters 5 and 6

Supplement: Pay attention to 6 points in ASA Statement for Quiz

[American Statistical Association Position Paper on p-values](#)

[Wasserstein Interview. \(American Statistical Association Executive Director\)](#)

[POST QUIZ IN CLASS VIDEO 1:: [Not even scientists can explain p-values](#)]

Readings Week 4: t-test

Chambers (2017): Chapter 4

Cumming & Calin-Jageman (2016): Chapters 7 and 8

Readings Week 5: t-test meta-analysis and open science

Chambers (2017): Chapter 5

Cumming & Calin-Jageman (2016): Chapter 9 and 10

[SSHRC Data Sharing Policy: Statement of Principles on Digital Data Management](#)
[Open Science Foundation \(OSF\) 101 \(1-hour\)](#)

Readings Week 6: correlation and correlation meta-analysis

Chambers (2017): Chapter 6

Cumming & Calin-Jageman (2016): Chapter 11

Readings Week 7: Regression and multiple regression

Chambers (2017): Chapter 7

Cumming & Calin-Jageman (2016): Chapter 12

Readings Week 8: Multiple regression continued

Chambers (2017): Chapter 8

Field et al. Regression Reading (and other supplements TBA).

Readings Week 9: One-way analysis of variance

Cumming & Calin-Jageman (2016): Chapter 14

Readings Week 10: N-way analysis of variance

Cumming & Calin-Jageman (2016): Chapter 15 and 16

Field et al. Chapter 12. Factorial ANOVA. Online course reserve.

Field et al. Chapter 13. Repeated Measures ANOVA. Online course reserve. Not on quiz.

Last day of regularly scheduled class: Exam (Not during exam period.)**Labs:**

Most weeks there will be a lab quiz.

Course Assignments and Tests:

Lecture Quiz. There will be a lecture quiz at the beginning of most classes. This quiz will be based, primarily, on the chapters assigned for that week but may also assess mastery of the previous lecture content. Your lowest two lecture quiz grade will be dropped. If you miss a class quiz for any reason it will receive a grade of zero and be dropped.

Lab Quiz. There will be a quizzes in most labs starting week 2. The lab quiz will **primarily** cover material from the lecture the previous few weeks. 85% of each lab quiz grade will be obtained from individual performance during the lab. 15% of each lab quiz grade will be obtained from group completion (groups of 3 or 4) of the same lab quiz. Individual lab quizzes are due at the end of each lab. The group lab quiz will be due the following day at noon. Group quizzes submitted late (no grace period) will receive a 20% penalty per day. Submission of group quizzes will occur via email. ***All group members must be cc'd on the email submission.***

Lab quizzes may also include a second section which requires you to re-analyze the data from the previous week (minus a few cases). This is done to encourage a reproducible workflow. submission time. Lab quizzes must be completed using rmarkdown – which will be covered in class.

Final Exam. The final is exam will involve analyzing data and writing it up in an APA style report.

Summary

Lecture Quizzes:	15%
Lecture Discussion:	25%
Lab Quizzes:	30%
Final Exam, Applied Data Analysis:	30%

	100%

Final examination date and time: Tues. November 27th, 8:30am in class

Final exam weighting: 30%

Course Resources

Required Texts:

Cumming, G., & Calin-Jageman, R. (2016). *Introduction to the new statistics: Estimation, open science, and beyond*. Routledge.

Chambers, C. (2017). *The seven deadly sins of psychology: A manifesto for reforming the culture of scientific practice*. Princeton University Press.

Additional academic articles will sometimes be assigned each week as part of the readings. Readings will be posted each week on Courselink.

Other Resources:

Course Resources: [CourseLink](#)

Course R Resources: [GitHub](#)

Additional Course Resource: [DataCamp](#)

We will be using R and RStudio in class. Both are free software. You can download and install them with the links below. I encourage you to do so before the first class. Some downloads are too large to be done over the universities wifi network (it could take several hours if you try).

R Download Links

The link depends on your system see headings below. Install software at links in order.

Windows users

1) Install R software: [here](#)

2) Install RStudio: [here](#)

- 3) Download Git: [here](#) (look to the right side of the screen for the computer picture)
- 4) Install Tex: [here](#)

MAC OSX:

- 1) Install graphic software at this link first: [here](#)
- 2) Install R software: [here](#)
- 3) Install RStudio: [here](#)
- 4) Install Git: [here](#) (look to the right side of the screen for the computer picture)
- 5) Install MacTek: [here](#) (warning very large download)

Course Policies**Grading Policies****Lecture Quiz Grading:**

The lowest lecture quiz mark will be dropped. A missed quiz, due to illness other reasons (e.g., **conferences**), will count as the lowest mark that is dropped. This policy is designed to facilitate attending conferences.

Lab Quiz Grading:

Each lab quiz will be graded out of 10. Marks are assigned for correct numbers, writing style, and APA style. The lowest lab quiz mark will be dropped

Group lab quizzes submitted late (no grace period) will receive a 20% penalty per day. Submission of group quizzes will occur via email. Group members must be cc'd on the email submission to receive credit.

Lab quiz grade may be grade-limited. A few principals underlying the course are so important that if they are violated your quiz grade will have a maximum value imposed. A single violation is enough to trigger this automatic grading action. Finally, if the exact numbers that are used in the report cannot be generated via code submitted the mark assigned to the quiz will be no higher than 70%.

Course Policy on Group Work:

Lab assignments must be completed on an individual basis (excluding the group component). Collaborations among students for the purposes of writing assignments are prohibited. Any student(s) suspected of unauthorized collaboration will be reported to the Dean's Office for an academic misconduct investigation (see Policy on Cheating & Academic Misconduct below).

Course Policy regarding use of electronic devices and recording of lectures:

Electronic recording of classes is expressly forbidden without consent of the instructor. When recordings are permitted they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

University Policies**Academic Consideration**

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, id#, and e-mail contact. See the academic calendar for information on regulations and procedures for

[Academic Consideration](#)**Academic Misconduct**

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the [Graduate Calendar](#):

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Student Accessibility Services (SAS) as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the [website](#).

Course Evaluation Information

Please refer to the [Course and Instructor Evaluation Website](#)

Drop date

The last date to drop one-semester courses, without academic penalty, is Nov 4, 2016. For regulations and procedures for Dropping Courses, see the Academic Calendar: [Current Graduate Calendar](#)