

PSYC08H3Y: Advanced Data Analysis in Psychology Online Asynchronous Course Summer 2021



Meet Your Teaching Team

Professor:

Name	Dr. Maria Iankilevitch
Email	maria.iankilevitch@mail.utoronto.ca
Student Hours	Wednesdays 4pm ET via Bb Collaborate
Lectures	Live on Wednesdays at 12pm ET via Bb Collaborate Note: lectures will be recorded and available asynchronously

Teaching Assistants:

Name	Contact	Tutorial Time	Tutorial Location
Michelle Huo	michelle.huo@mail.utoronto.ca	TBD	Bb Collaborate
Sadia Riaz	sadia.riaz@mail.utoronto.ca		
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Vignash Tharmaratnam	vignash.tharmaratnam@mail.utoronto.ca		



Meet & Greet: You are invited to a meet and greet with your course instructor! Bring your tea/coffee and pets! This is an optional informal event where you can get to know a bit about your course instructor and other students in the course virtually face-to-face. You are welcome to join whether you have a camera or not. The event will be held on Tuesday, May 11th at 10am ET and at 7pm ET. You can attend the event on [Bb Collaborate](#) in Quercus. I hope to see you there!

Prerequisites



Prerequisites: [PSYB07H3 or STAB23H3 or STAB22H3] and [an additional 0.5 credit at the B-level in PSY course]

Note about Prerequisites: Students are responsible for ensuring that they have the necessary course prerequisites. Contact the department and/or the course instructor if you have questions about this.

Exclusions: (STAC52H3), PSY202H

Breadth Requirements: Quantitative Reasoning

Enrolment Restrictions: Restricted to students in the Specialist/Specialist Co-op and Major programs in Psychology, Mental Health Studies, Neuroscience, and Paramedicine. Students in the Minor program in Psychology will be admitted as space permits.







Course Description



This course is a continuation of PSYB07. The primary focus of this course is on the understanding of Analysis of Variance and its application to various research designs (e.g., one-way between-subjects, repeated-measures, factorial, mixed-design, etc.). Examples will include *a priori* and *post hoc* tests. We will also explore non-parametric options for the analyses. Finally, there will be an introduction to multiple regression, including discussions of design issues and interpretation problems.



Learning Goals

By the end of the course, students should be able to...	
 Understand	Explain which statistical analyses to conduct for a given study design. Explain the logic behind each analysis.
 Apply	Calculate the appropriate statistic for the appropriate purpose. Apply your understanding of statistics to answer various research questions.
 Analyze	Examine, compare, and contrast different types of study designs and analyses. Organize, structure, and analyze data. Use statistical software to explore and analyze publicly available data to answer a research question.
 Evaluate	Evaluate the quality of statistical analyses that have been already conducted. Think critically about data and analyses. Decide the best course of action to proceed with. Draw conclusions based on evidence.
 Create	Design and execute a plan for conducting analyses about a novel research question.
 Communicate	Convey research ideas and research findings in written communication. Communicate information in a clear and concise manner.

Course Resources and Required Materials



This course is completely online. Therefore, you will need a computer with Microsoft Office (Word and PDF) and Internet access.



The required textbook for this class is: **Bors, D. (2018). *Data analysis for the social sciences: Integrating theory and practice*. London, UK: SAGE Publications Ltd.** Print copies will be available online for shipping or curbside pickup at the University Bookstore. Electronic copies can be rented or purchased online through the University Bookstore using the following link: <https://uoftbookstore.vitalsource.com/textbooks?term=9781526422309>. You can also find electronic copies on Amazon Kindle and Google Play.



The course website is **Quercus** and can be found at <http://q.utoronto.ca> where all course-related information will be posted. Please take the [Course Tour](#) prior to the start of the course to familiarize yourselves with the course website.





You will need to check your University of Toronto email account **daily** for relevant updates. These can be personal emails or class-wide announcements.



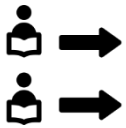
You will need a scientific (non-graphing) calculator for this course to be able to work on problems. It is recommended that the calculator have exponents, brackets, square root, etc., which are standard functions on a scientific calculator.



This course will include an introduction to R. In particular, we will use **R and RStudio** to run some analyses. R is a programming language and open access software that is freely available for download and use. RStudio is used to interface with R in a user-friendly manner. You will need to download both R and RStudio for this course. Please note that you must download R first and then RStudio.

 Guide to Download R	Guide to Download RStudio 
<ol style="list-style-type: none"> 1. Visit the following site: www.r-project.org 2. Click on “CRAN” in the “Download” section on the left 3. Click “Download R for [your system operator]” 4. Windows: click “base” in the “subdirectory” on the left, then click “Download R 4.0.2 for Windows”; Mac: choose “R-4.0.2.pkg” in the “latest release” section 5. Open the downloaded file and follow the instructions to install the program 	<ol style="list-style-type: none"> 1. Visit the following site: https://rstudio.com/products/rstudio/download/ 2. Under RStudio Desktop, click “Download” 3. Download the version for your operating system and follow the instructions to install the program

Lectures



Synchronous (optional): Lectures will be recorded on Wednesdays at 12:00pm ET (beginning 10 minutes past the hour) on Quercus via [Bb Collaborate](#). Students are welcome to attend the lectures synchronously if they wish to, however there are a few things to consider. Keep in mind that these lectures are being recorded and will be posted for the entire class to view. This means that student comments (and possibly names) will be recorded as well. All recordings will only be shared on the Quercus website with members of this course and may not be posted anywhere else or shared with anyone else. Each lecture will take approximately 3 hours long.



Asynchronous: Lectures will become available to be viewed asynchronously in the lecture [modules](#) on Wednesdays when recordings are complete. Lecture [modules](#) will include lecture slides in PDF format, recorded videos of the lecture, and lecture-based practice questions or activities. Please note that the lecture slides posted are meant to scaffold students’ learning and do not contain the level of detail that is required to do well in this course. Students will need to complete lecture [modules](#) to gain the full scope of the information. The lecture-based practice questions are meant to give students an opportunity to practice course concepts and to gauge the degree to which students are understanding and connecting course concepts. Lecture-based practice questions are a great place for students to critically think about their learning and to revisit concepts if necessary. Each lecture [modules](#) should take approximately 3 hours long to complete.

Importantly, **students are expected to complete all lectures** (either synchronously or asynchronously). **Lecture slides are not a suitable replacement for attending lecture.** This is because lecture slides are not exhaustive, and we will cover important material that will go beyond what is found in them during lecture. It is your responsibility to know all material that is taught in lectures for the exams.

Course Communication and Support

As a first step, you should always check the syllabus and the course website to find the answer to your questions. If you do have a question, there are several ways you can get help. Given that oftentimes multiple people have the same question, we will make use of discussion boards so that everyone can see questions that are asked. Students are also encouraged to answer each others’ questions on the discussion boards to help build our classroom community. Below are different way that you can find information and get support in this course:

1. Check Quercus (i.e., syllabus, discussion boards, assignment instructions, lectures, etc.)



2. Ask questions synchronously during live recording sessions.
3. The [Ask a Question – Content](#) discussion board should be your first go-to for general course-related questions. This includes questions about logistics of the course and about the course content.
4. The [Ask a Question – Assessments/Course Logistics](#) discussion board is your first go-to for questions related to assignments.
5. Visit the TA's tutorials. For most weeks in the semester, each TA will hold a tutorial. You are encouraged to visit the tutorial of any TA and to visit the tutorials of more than one TA each week. Each TA has their own style of teaching and may have different content; therefore, you will get the most out of going to multiple tutorials.
6. Students are welcome to attend the professor's student hours for one-on-one virtual meetings.
7. There will be times in the semester (close to certain course deadlines) when the TA's have additional student hours. Students are welcome to visit the TA's student hours during those times.
8. Students can also email the TA's or the professor to set up a virtual one-on-one meeting.
9. For questions of a personal nature (e.g., extensions, concerns, accessibility, illness, etc.), students should email the professor and can set up a virtual one-on-one meeting if needed.



Discussion boards: We will be using discussion boards to post comments and questions throughout this course. Please keep in mind that everyone will be able to see these posts. All posts should be written in a professional and respectful tone. In online communication though, it is easy to misunderstand or misread the tone of something written. Therefore, here are some tips for how to remain respectful via online communication, whether creating an original post or responding to someone else's post:

- Avoid making personal comments about other individuals and focus instead on the topic at hand. You should avoid commenting on the value of others.
- Use only language and wording that you would say to someone face to face. If you would not say something in person, then it is best to avoid writing it.
- Avoid using all caps or exclamation points, which can often convey an angry or sarcastic tone.
- Avoid using sarcasm or humour in the questions you ask. These can easily be misunderstood as making fun of someone, as rude, and/or as insulting.
- Use full sentences and proper spelling. This conveys that you take the subject-matter seriously.
- You should remain professional and respectful in your communication even if someone else has written a post that seems unprofessional or disrespectful. Remember that much of what is written can be misinterpreted and the person who made the unprofessional or disrespectful post may not realize that their post is upsetting. Therefore, please be forgiving for your own sake.

Your instructor and TA's will be monitoring all posts and will provide students with feedback if needed. If there are any posts that are unprofessional, disrespectful, or otherwise upsetting, you may email the course instructor directly about it.

Students can expect a **response within 48 hours not including weekends** for questions posted on a discussion board. If we have not answered your post in two business days, feel free to send a follow-up email.

Emails: When communicating via email please adhere to the following protocols:

- Students can expect an **email response within 48 hours not including weekends** (do not email the night before an assignment is due with a question about the assignment, we might not see your email in time to send a helpful reply). If we have not answered your email in two business days, feel free to send a follow-up email.
- Please consult the course outline, other handouts, and the course website BEFORE submitting inquiries by email.
- If you want to set an appointment for a virtual meeting, include a **variety of dates and times** that would work for you, and allow a few days for us to get back to you. Please do not email the night before and expect us to be available the next day.



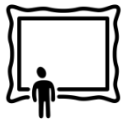
- In the subject line indicate the course code and the topic of your email (e.g., PSYC08 assignment question).
- Emails should come from your utoronto email account to communicate with the course instructor and the TA's.
- All communications (verbal, email) should be respectful in language and tone and constructive in nature. This includes communications with the course instructor, with the TA's, and with your fellow students.



Student hours: Student hours (i.e., virtual office hours) will run from May 12th to August 4th (except for during reading week, during exam week, or during holidays). These student hours are a great way to ask your course related questions that require more in-depth conversation face-to-face. You are also welcome to visit student hours to ask about life beyond course content (e.g., where to find writing help, where to find resources for mental health, general time management strategies, employment after undergrad, general research methodological questions, etc.). During student hours, we will be able to turn on our webcams to have an (almost) in person conversation. If you would like the meeting to be voice only (no cameras), then please let us know before the meeting and we will accommodate this.



Tutorials: tutorials will run from May 20th to August 10th. Each TA will run a tutorial session every week except for during reading week, on exam days, or during holidays. While tutorials are not mandatory, they are meant to supplement your learning and you are encouraged to visit multiple tutorials each week. It is your choice whether to attend tutorials or not, however, students who have taken advantage of visiting one or more tutorials each week have found them very helpful for their learning and for studying the material! Importantly, there is no guarantee that tutorials will be recorded.



The big picture: Ultimately, **you are not alone** in this course and the teaching team is here to support you! All you need to do is take advantage of the many resources available! We look forward to interacting with you all!

Course Feedback

You may submit feedback anonymously about the course at any time throughout the semester by completing a brief feedback form, which can be found on the [Feedback about the Course](#) page in the "Ask a Question & Give Feedback" module on Quercus. You may submit feedback as many times as you would like to throughout the course. This is a way to keep in touch with the professor and share with her either:

- Difficulties that may arise with the comprehension of the subject matter;
- Insights on the various topics and critical reflections;
- Positive experiences that you are having in the course and that you would like to see continue;
- Any other feedback that is relevant, constructive, respectful, and would serve to improve the content or the delivery of the lectures and make them a better learning experience.

Informative feedback is the cornerstone of a positive learning environment. As such, the professor will make sure to read all feedback submitted by students weekly. However, it may be impossible to reply to and incorporate all of the feedback received. The professor will follow up on the more impactful or important pieces of feedback by anonymously sharing them with the entire class at the start of the following lecture. This will be a way to address recurring concerns or to come back on the previous week's content. Your comments are important and appreciated, and you can (and should) always communicate directly with the professor or the TA's should you feel that you require immediate attention.

Important Course Policies



Academic integrity: The University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (<https://governingcouncil.utoronto.ca/secretariat/policies/code-student-conduct-december-13-2019>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences.

Potential offences in assignments include using someone else's ideas or words without appropriate acknowledgement, submitting your own work in more than one course without the permission of the instructor, making up sources or facts, obtaining or providing unauthorized assistance on any assignment. On exams cheating includes using or possessing unauthorized aids, looking at someone else's answers during an exam, or misrepresenting your identity. In all academic work, violations of academic integrity include misrepresenting your identity, falsifying institutional documents or grades, or falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.



Accessibility needs: Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the [AccessAbility Services Office](#) as soon as possible. [AccessAbility Services](#) staff (located in Rm AA142, Arts and Administration Building) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations 416-287-7560 or email ability@utsc.utoronto.ca. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.



Lecture recordings and class materials: The synchronous classes will be recorded on video and will be available to students in the course to view after each class. These recordings and all course materials (e.g., syllabus, lecture slides, practice questions, etc.) are the intellectual property of the professor. These course materials are provided for the exclusive use of enrolled students for the purposes of completing this course. As such, you may not share these materials with others. The professor does not want to discover that a student has put any of her materials into a public domain, has sold her materials, or has given her materials to a person or company that is using them to earn money. The University will support the professor in asserting and pursuing her rights and copyrights in such matters.



Late submissions: I strongly encourage you to schedule your time such that you plan on starting your work far before the deadlines. It is up to you to schedule your time appropriately to complete all components of the course on time.

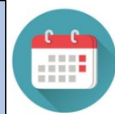
Extensions: Extensions may be granted for good reason (e.g., illness). Extensions are at the instructor's discretion and are **not guaranteed**. All extension requests must be made **before the due date**. If an extension is granted, there will be no penalty for lateness.

Assignment: If no extension is granted there will be a 10% penalty for each day late including weekends. The late penalty begins at the deadline. **Assignments will not be accepted if more than 5 calendar days have passed beyond the due date.**

Homework: Grades of zero will be assigned for homework not submitted by the due date time (even by a few minutes) unless you have arranged for an extension prior to the deadline.

Exams: As with all exams, no late submissions will be possible.

For work missed due to extenuating circumstances, please see the "Psychology Department's Missed Term Work Policy" below.



Religious accommodation: As a student at the University of Toronto, you are part of a diverse community that welcomes and includes students and faculty from a wide range of cultural and religious traditions. For my part, I will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. Further to University Policy, if you anticipate missing a major course activity due to a religious observance, please let me know as early in the course as possible, and with sufficient notice (at least two to three weeks), so that we can work together to make alternate arrangements.

Grades posted on Quercus: Please note that the grades posted on Quercus are for your information only to track your progress throughout the course. No grades are considered official until they have been formally approved by the department at the end of the semester.



Psychology Department's Missed Term Work Policy

For missed term work (assignments and term tests) due to illness, emergency, or other mitigating circumstances, please follow the procedures outlined below.

Notes:

- The following reasons are not considered sufficient for missed term work: travel for leisure, weddings, personal commitments, work commitments, human error.
- Missed Final Exams are handled by the Registrar's Office and should be declared on eService: <http://www.utsc.utoronto.ca/registrar/missing-examination>
- Instructors cannot accept term work any later than five business days after the last day of class. Beyond this date, you would need to file a petition with the Registrar's Office: <https://www.utsc.utoronto.ca/registrar/term-work>

Accommodations for Illness or Emergency:

For missed work due to ILLNESS OR EMERGENCY, please complete the following two-step process:

1. Complete the **Request for Missed Term Work Accommodations Form** (<http://uoft.me/PSY-MTW>) and email it to Keely Hicks at keely.hicks@utoronto.ca

and

2. **Declare your absence** on **ACORN** (Profile & Settings > Absence Declaration)
Deadline: You must complete the above steps **within 3 business days** of the missed

work.

Note: For this semester, we do not require any additional supporting documentation (ex. medical notes) to support your missed term work accommodation request.

Accommodations for Academic Conflicts:

For missed term work due to an ACADEMIC CONFLICT (i.e. two midterms scheduled at the same time), please complete the following process:

1. Complete the **Request for Missed Term Work Accommodations Form** (<http://uoft.me/PSY-MTW>), choosing "Other" as your reason for missed work and explaining the conflict in the space provided.
2. Take screenshots of your course homepages that demonstrate the conflict.
3. Email the form and screenshots to Keely Hicks (keely.hicks@utoronto.ca).

Deadline: You should report the conflict to Keely Hicks (keely.hicks@utoronto.ca) **at least two weeks (10 business days) before the date of the activity**, or as soon as possible if it was not possible to identify the conflict earlier.

Note: Multiple assignments due on the same day are not considered conflicts.

Accommodations may only be possible in the case of quizzes and tests that are both scheduled during the same discrete period. Back-to-back tests/quizzes are not considered conflicts.

Note: Students are responsible for keeping their course timetables conflict-free. Students who choose to register in two synchronous courses with overlapping lecture/tutorial/lab schedules may not necessarily be accommodated.

Accommodations for Religious Conflicts:

For missed term work due to a RELIGIOUS CONFLICT, please complete the following process:

1. Complete the **Request for Missed Term Work Accommodations Form** (<http://uoft.me/PSY-MTW>), choosing "Other" as your reason for missed work and noting "Religious conflict" in the space provided.
2. Email the form to Keely Hicks (keely.hicks@utoronto.ca).

Deadline: You should report the conflict to Keely Hicks (keely.hicks@utoronto.ca) at **least two weeks (10 business days) before the date of the activity**, or as soon as possible if it was not possible to identify the conflict earlier.

Accommodations for Time Zone Conflicts:

If you are physically in a different time zone and a quiz or midterm is scheduled outside of 7:00am to midnight in your local time, please complete the following process:

1. Complete the **Time Zone Conflict Form** (<https://uoft.me/PSY-TimeZone>), and
2. Email the form to Keely Hicks (keely.hicks@utoronto.ca)

Deadline: You should report the conflict to Keely Hicks (keely.hicks@utoronto.ca) at **least two weeks (10 business days) before the date of the activity**, or as soon as possible, if it was not possible to identify the conflict earlier.

Accommodations for Students Registered with AccessAbility Services:

For missed **TERM TESTS** due to ACCESSABILITY REASONS:

- **Contact your AccessAbility consultant** and have them email Keely (keely.hicks@utoronto.ca) detailing accommodations required.

For missed **ASSIGNMENTS** due to ACCESSABILITY REASONS:

- If your desired accommodation is **within the scope** of your Accommodation Letter (ex. your letter includes “extensions of up to 7 days” and you need 3 days):
 1. Complete the **Request for Missed Term Work Accommodations Form** (<http://uoft.me/PSY-MTW>).
 2. Email the form and your **Accommodation Letter** to Keely Hicks (keely.hicks@utoronto.ca).
- If your desired accommodation is **outside the scope** of your Accommodation Letter (ex. your letter includes “extensions of up to 7 days” but you need more time than that):
 1. **Contact your AccessAbility consultant** and have them email Keely Hicks (keely.hicks@utoronto.ca) detailing the accommodations required.

Accommodation Procedure:

Within approximately one to five business days, you will receive a response from your instructor detailing the accommodations to be made (if any). **You are responsible for checking your official U of T email and Quercus course announcements daily**, as accommodations may be time-critical.

For missed assignments, **do not wait for an instructor response to resume work on your assignment**. Extension accommodations may be as short as one business day, depending on the nature of the illness/emergency. You should complete your assignment as soon as you are able and email it your instructor, noting that you have submitted your Missed Term Work Accommodations Request Form to Keely.

Note that ACORN will not allow you to declare **future absences**. For something like a scheduled surgery or an illness with a prolonged recovery period, if you would like to request accommodations in advance of the assignment deadline or midterm you should submit a Verification of Illness Form (<http://uoft.me/UTSC-Verification-Of-Illness-Form>) completed by your doctor, along with this form to Keely Hicks (keely.hicks@utoronto.ca).

Completion of this form does not guarantee that accommodations will be made. The course instructor reserves the right to decide what accommodations (if any) will be made. Failure to adhere to any aspect of this policy may result in a denial of your request for accommodation.

Missed Accommodations

If an accommodation is granted but a continued illness/emergency prevents you from meeting the requirements of your accommodation, you must repeat the missed term work procedure to request additional accommodations. **Please make it clear in your subject line that you are requesting a second accommodation**. Note that in the case

of a missed make-up test, an opportunity to write a second make-up test may not be provided.

(E.g.) If you are given an extension but are still sick and need more time, or if you miss a make-up midterm, you would need to submit another Request for Missed Term Work Accommodations form and declare your extended absence on ACORN.

Importance of Three Business Day window:

If you are unable to submit your documents within the three business day window, **you must email Keely (keely.hicks@utoronto.ca) within the three business day window** to explain the nature of the delay, and when you will be able to provide your documents. Exceptions to the documentation deadline will only be made under **exceptional circumstances**.

Questions?

If you have any questions about this Missed Term Work policy, please contact Keely Hicks (keely.hicks@utoronto.ca) **well before** the date of the test / assignment deadline to describe your circumstances and inquire about procedures.

Helpful Resources for Student



Statistical Help and Resources¹

Textbook Interactive Demonstrations: <https://study.sagepub.com/bors/student-resources>

Khan Academy: <https://www.khanacademy.org/math/statistics-probability>

APA Formatting: <https://apastyle.apa.org/style-grammar-guidelines>

General Academics²

UTSC Student Policies: <https://www.utoronto.ca/studentaffairs/student-policies>

UTSC Dates and Deadlines: <https://www.utoronto.ca/registrar/academic-dates>

UTSC Health & Wellness Center: <https://www.utoronto.ca/hwc/>

AccessAbility: <https://www.utoronto.ca/ability/>

Skill Building, Future Planning, Academic Advising, Career Centre:
<https://www.utoronto.ca/aacc/>

Writing Support: <https://www.utoronto.ca/twcl/>

English Language Development Centre: <https://www.utoronto.ca/eld/>

Psychology Lab Opportunities: <http://tinyurl.com/jjq25t7>

Successful Learning Online

UTSC Center for Teaching and Learning's Assignment Calculator breaks down your work into small steps and creates a feasible calendar for completing your assignments:

<https://ctl.utoronto.ca/assignmentcal/>

UTSC Academic Advising & Career Center's Time Management Help:

https://www.utoronto.ca/aacc/sites/utoronto.ca.aacc/files/tipsheets/Academic_Advising_Tipsheets/timemanagement.pdf

UTSC Academic Advising & Career Center's Daily Task Planner & Journal:

https://www.utoronto.ca/aacc/sites/utoronto.ca.aacc/files/tipsheets/Academic_Advising_Tipsheets/DailyTaskPlannerJournal.pdf

University of Toronto's Center for Teaching Support and Innovation's 5 Tips for Learning

Online/Remotely: <https://teaching.utoronto.ca/teaching-support/strategies/continuity-planning/5-tips-for-students/>

Society for Personality and Social Psychology's 8 Tips for Working from Home:

http://spsp.org/news-center/announcements/8-tips-productive-remote-work?_zs=7f7eX&_zl=B8E42



¹ Many thanks to Dr. Olivia Podolak Lewandowska who compiled much of the list of statistical help and resources for students and who graciously allowed me to share the list in this syllabus.

² Many thanks to Dr. Michael Souza who compiled much of the list of academic resources for students and who graciously allowed me to share the list in this syllabus.

Course Assessments

Component	Due Date	Weight
Homework	Tuesdays at 11:59pm ET	10% (1% each, best 10/11)
Assignment Plan (Optional)	July 14 at 11:59pm ET	0%
Assignment	August 4 at 11:59pm ET	30%
Midterm Exam	Stage 1: Week of June 28 Stage 2: July 5 at 10am & 8pm ET	30%
Final Exam	Stages 1 & 2 TBD during exam period	30%

Homework: The goal of weekly homework is to get students to practice and apply what they are learning each class. Homework will be assigned in 11 weeks of the semester. I understand that sometimes we experience an off week, therefore, the lowest score will be dropped and only the best 10 scores will count towards your grade. Homework questions will be assigned and graded automatically on Quercus.

Assignment: The overall goal of this assignment is for students to apply what they learn about data analysis to a research question of students' choosing using publicly available data. Students will be provided with a publicly available dataset with a number of variables. It is up to each student to explore the variables in the data set, identify a research question that can be answered with these variables, outline statistical hypotheses, create an analysis plan, use statistical software to execute the planned analyses, and write a final report. Students will be required to conduct all data analyses using R. The assignment is meant to challenge your knowledge about course content and refine your skills in data analysis and scientific writing.

Below are important recommendations for the assignment:

1. I strongly encourage you to begin this project early in the semester and work on it a little bit at a time throughout the semester. This assignment is not meant to be completed in one sitting.
2. I strongly suggest that you back up your work as you are working on the assignment. There are many parts to the assignment and several things may occur that cause someone to lose their work. Therefore, it would be wise to have a backup in a different location (e.g., email, usb, external hard drive, etc.) as you are working on the assignment. No extensions will be granted based on loss of work or other technological failures.
3. Ensure that you receive confirmation from Quercus that your work is submitted after you click the submit button. It is your responsibility to make sure that the work is not in progress but is fully submitted. Furthermore, all work must be submitted on Quercus and attachments to emails will not be accepted.

Assignment Plan (Optional): You will have an opportunity to submit an analysis plan (i.e., the research question, hypotheses, analysis plan for each analysis required) by July 14th at 11:59pm ET to receive feedback from one of the TA's. The analysis plan will include your research question, hypotheses, analysis plan for each analysis required. The submission will not be graded and is optional (i.e., you do not need to submit the plan if you do not want to), however, it is a chance for you to get feedback from a TA about what you plan to do before actually doing it. Please keep in mind that submitting an assignment plan and receiving feedback from the TA does not guarantee a "good" grade on the assignment. Late submissions will not be accepted.

Exams: Overall, the questions in the exams are designed to not only test students' knowledge of course material, but also students' ability to apply the concepts in novel situations. We will use two-stage exams for the mid-term and the final exam. This means that each exam will be completed in two stages. Stage 1 must be completed by everyone and Stage 2 is optional. If you perform better in Stage 1, then 30% of your final grade will come from Stage 1 and 0% will come from Stage 2. If you perform better on Stage 2, then 25% of your final grade will come from Stage 1 and 5% will come from Stage 2. Therefore, there is no penalty if your performance is lower in Stage 2 or if you miss Stage 2.

Why two-stage exams? Two-stage exams have been used in various universities. Overall, two-stage exams have been shown to reduce exam anxiety and increase exam enjoyment (Gilley & Clarkston, 2014; Leight et al., 2012; Mahoney & Harris-Reeves, 2019; Zipp, 2007). Furthermore, this transforms examinations into new learning opportunities that allow students to better remember the material and to think about it at a deeper level (Cortright et al., 2003; Gilley & Clarkston, 2014).

Detailed information about the exam format will be provided throughout the semester. In the meantime, below is some important information about the structure of the exams.

	Stage 1	Stage 2
What is the goal of each stage?	The goal of this stage is to assess your individual learning of the course material. The work submitted must be your individual work and you may not work with others.	The goal of this stage is to work with other students to answer exam questions. This stage can allow for deeper discussions about statistics among students and can serve as both an assessment and as a learning opportunity for students. Students will be randomly assigned to groups and will work with their assigned group to respond to questions provided for them in this stage. Note: the questions may be the same or different than those in Stage 1.
How do I complete each stage?	This stage is asynchronous and completed individually. Each student in the class will submit their work individually.	This stage is synchronous and completed in groups with other students. Each group will submit one set of answers. Note: you must have your video camera on for this stage. A TA will visit your group during the session, and you will need to hold up your ID to the camera and show your face for verification.
How much time do I have to complete each stage?	This stage should take you about 2 hours to complete if done in one sitting. However, the exam will be available on Quercus for 24 hours. Exact dates TBD.	One morning and one evening session will be scheduled for each exam. You can attend one session and must arrive on time if you want to participate in the session. We will begin on the hour. Each session will be 1 hour long, however, you will have 30 minutes with your group to complete and submit this stage of the exam. The other 30 minutes will be organizational.
What resources can I use in each stage?	You can use the course textbook and notes for this class during Stage 1. However, you cannot collaborate with other people or search for the answers elsewhere (e.g., Google) during this stage.	You can use the course textbook and notes for this class. You can also collaborate with other students in your group. However, you cannot search for the answers elsewhere (e.g., Google) during this stage.
How can I ask questions during each Stage?	The teaching team will be available online to answer students' questions during some of the 24-hour exam period. Outside of these hours, responses may not be as quick. The course instructor will provide more details about this closer to the exam date.	The TA's will visit every group during the session. You can ask questions when the TA visits your group.
What if I miss one of the stages?	This stage must be completed by every student and works just like any exam in any other course. You will need to follow the Missed Term Work Policy if you miss this stage.	This stage is optional. If you miss this stage, then the entirety of your exam score will come from Stage 1. Given that this stage includes group work, and you will not lose points for missing this stage, there will be no makeups for missing this stage.

Course Outline and Schedule

Note: The lecture topics are guidelines about what topics we will cover over the course of the term. Some lectures might be longer than expected and run into the following week, whereas others will be shorter and will allow us to get ahead on the following week's lecture. Lectures are 3 hours.

LECTURE #	DATE	TOPIC	HOMEWORK DUE	CHAPTER
1	Wednesday, May 12	Intro to Course and Review of Concepts from PSYB07 Note: no tutorials during first week of class	Tuesday, May 18	1-6
2	Wednesday, May 19	T-Tests vs. Analyses of Variance (ANOVA's)	Tuesday, May 25	8
3	Wednesday, May 26	One-Way ANOVA	Tuesday, June 1	8
4	Wednesday, June 2	Randomized Block Design – ANCOVA	Tuesday, June 8	8 & 9
5	Wednesday, June 9	Randomized Block Design – Repeated Measures ANOVA	Tuesday, June 15	9
6	Wednesday, June 16	Non-Parametric Tests – Kruskal-Wallis & Friedman's Tests	Tuesday, July 6	6, 8, & 9
N/A	Wednesday, June 23	READING WEEK: NO LECTURES OR TUTORIALS		
N/A	Week of: June 28-July 5	Midterm Exam (Lectures 1-6 Content): NO LECTURES OR TUTORIALS Stage 1: Date TBD Stage 2: July 5 at 10am ET & 8pm ET (visit one session maximum)		
7	Wednesday, July 7	Multiple Comparisons – A Priori Tests	Tuesday, July 13	10
8	Wednesday, July 14	Multiple Comparisons – Post Hoc Tests Assignment Plan (Optional) Due	Tuesday, July 20	10
9	Wednesday, July 21	Factorial ANOVA & Simple Effects	Tuesday, July 27	11
10	Wednesday, July 28	Mixed-Design ANOVA & Simple Effects	Tuesday, August 3	11
11	Wednesday, August 4	Open Lecture: Spill-Over Content and/or Review Assignment Due at 11:59pm ET	Tuesday, August 10	N/A
Final Exam during the exam period (covers all lectures and associated readings): Time, date, and location will be announced on Quercus and in lectures.				