UNIVERSITY OF CALGARY

DEPARTMENT OF PSYCHOLOGY
Faculty of Arts

PSYC 615	Course Name: Analysis of Variance		Fall 2021

Instructor:	Tom O'Neill	**Lecture Location:**	Zoom
Phone:	403-893-3759 (cell)	**Lecture Days/Time:**	R 1:00PM - 3:45PM
Email:	toneill@ucalgary.ca	**TAs:**	Kelsey Cnudde kelsey.cnudde@ucalgary.ca Michael McCarthy michael.mccarthy@ucalgary.ca
Office:	AD 264	**Lab Location:**	Zoom
Office Hours:	By appointment	**Lab Day/Time:**	F 1:30PM – 4:15PM

Course Description and Objectives
This course covers statistical techniques that are commonly used in behavioural research, especially Psychology, and therefore emphasizes the use of linear models to analyze data that have been collected with emphasis on balanced experimental designs. The labs will provide students with opportunities to work on statistical problems related to the lectures.

Acknowledgments and Respect for Diversity
Our classrooms view diversity of identity as a strength and resource. Your experiences and different perspectives are encouraged and add to a rich learning environment that fosters critical thought through respectful discussion and inclusion. The Department of Psychology would also like to acknowledge the traditional territories of the people of the Treaty 7 region in southern Alberta. The City of Calgary is also home to Métis Nation of Alberta, Region III.

Course Format
The course will be delivered in a hybrid of asynchronous and synchronous features. Voice-over PowerPoint asynchronous lectures will be provided by the beginning of each week on D2L. Students are expected to study these files prior to the lecture on Thursdays. During the synchronous lecture, an emphasis will be placed on an overview of the topic, participating in activities and problem-solving exercises, and question and answer periods.

The lab component of the course will also be delivered in a hybrid of asynchronous and synchronous features. Students will be required to access either the program R (available for free at https://cloud.r-project.org and RStudio at http://www.rstudio.com/download) or SPSS software (available from the university software distribution portal, https://iac01.ucalgary.ca/SDSWeb/LandingPage.aspx?ReturnUrl=%2fSDSWeb%2fdefault.aspx) to complete the lab activities.

Prerequisites
The course material is designed with the assumption that students have completed an undergraduate statistics course covering an introduction to the topics covered in this course.

Supplemental Texts and Readings
These are supplemental, we recommend waiting until after the first class before considering purchasing.

For R users: Field, A., Miles, J., Field, Z. (2012). Discovering Statistics Using R. University of Sussex, UK: SAGE publishing Ltd.

For SPSS users: Field, A., (2018). Discovering Statistics Using IBM SPSS Statistics (North American Edition; FIFTH ed.). University of Sussex, UK: SAGE publishing Ltd. 816 pages.

Advanced, Optional Text
Maxwell, S. E., & Delaney, H. D. (2004). Designing Experiments and Analyzing Data: A model comparison perspective (2nd ed.). Mahwah, N.J.: Lawrence Erlbaum Associates. The companion website for this book is at www.designingexperiments.com. This text should be available from other graduate students and faculty in the department… there are many copies around. The library also has copies.

Assessment Methods
Exams: There will be a midterm and final exam, with weightings detailed below. **Please refer to *Absence From A Test/Exam* section in case of absence from the exams.** Format is very short answer, short answer, and long answer with a problem-solving and application focus. The exam will be posted to D2L at the beginning of the scheduled lecture and it must be submitted within 24 hours. The exam will be a 2-hour exam; however, students may take up to 3 hours to complete the exam. The exam should be opened only when the student is prepared to begin, and the exam should be submitted within 2-3 hours of that time, within the prescribed 24-hour exam period. The exam must be submitted using the same file name convention on D2L as lab assignments, described above. Exams in this course are open book, take-home exams. For this course, an open book, take-home exam means that the use of class notes and the textbook is permitted. The use of online resources and calculators is permitted. Students may not communicate with others about course material or the exam either in person or electronically during exams. In other words, students are required to complete the exams individually without any consultation with peers, and the exam will be open-book, take-home format so any materials can be consulted during the exam (both materials made available through this course and elsewhere).

Lab Assignments: Due by 11:59PM one week after assigned (i.e., Fridays; see schedule below). Each laboratory assignment will be graded by the lab following the deadline. **Assignments must be uploaded to D2L**. Save the file as: Lastname_Firstname_Assignment#. **Late assignments will receive a deduction of 20% unless prior accommodations have been confirmed.** If you cannot submit your assignment by the due date you must contact the instructor or TA *prior to the deadline* to be considered for accommodation.

Additionally, students will be provided with a **late bank of 5 days** to use throughout the semester as they choose for lab assignment deadlines. To use days from the late bank, students *must* email the TAs *before the original assignment deadline* to indicate that they will be submitting the assignment late and

using time from the late bank (providing a reason why is not necessary). Students must declare how many late days they will be using and indicate their new due date. **If an assignment is submitted past the adjusted due date and prior accommodations have not been made, the assignment will receive a deduction of 20%**.

Dates and Weighting*:
Exam 1: 25% of final grade; Thursday, October 21
Exam 2: 35% of final grade; Thursday, December 9. The format will be identical to Exam 1. The take-home exam will be cumulative, with emphasis on the material covered following Exam 1.
Lab Assignments: 40% of final grade; see Lab Schedule
*Students must achieve a passing grade on both the class and lab components to pass this course.

University of Calgary Academic Integrity Policy
Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity.
Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional code of conduct and promote academic integrity in upholding the University of Calgary's reputation of excellence. It is your responsibility to ensure that you have read and are familiar with the student academic misconduct policy: https://www.ucalgary.ca/policies/files/policies/student-academic-misconduct-policy.pdf.

Faculty of Graduate Studies Grading System
A+ = Outstanding performance, A = Excellent performance, A- = Very good performance

B+ = Good performance, B = Satisfactory performance, B- = Minimum pass

C+ All grades of "C+" or lower are indicative of failure at the graduate level and cannot be counted toward Faculty of Graduate Studies course requirements. Individual programs may require a higher passing grade

Grading Scale

A+	96-100%	B+	80-84%	C+	67-71%	D+	54-58%
A	90-95%	B	76-79%	C	63-66%	D	50-53%
A-	85-89%	B-	72-75%	C-	59-62%	F	0-49%

It is at the instructor's discretion to round off either upward or downward to determine a final grade when the average of term work and final examinations is between two letter grades.

To determine final letter grades, final percentage grades will be rounded up or down to the nearest whole percentage (e.g., 89.5% will be rounded up to 90% = A but 89.4% will be rounded down to 89% = A-).

Tentative Lecture Schedule
Ideally in table format with date of class, topics to be covered, and chapters/readings to be read. Due dates for tests/exams and assignments should be included in this schedule as well.

Date	Topic/Activity/Readings/Due Date (revise and add columns & rows as necessary)
R Sep 9	First day of lectures Course Introduction SPINE of Statistics: A Review of the Basics – p. 39-69 & 171-181 Tests to Compare Between & Within Groups – p. 325-356 & 384-396 (*pretty much the whole text though…*)
T Sep 14	
R Sep 16	Last day to drop a class without financial penalty ANOVA, Power, Confidence Intervals & Assumptions – p. 50-67, 87-90, 200-203, 186-196
F Sep 17	Last day to add or swap a course
T Sep 21	
R Sep 23	Focused tests/Planned Comparisons – Chapter 10, Chapter 12
F Sep 24	Fee payment deadline for Fall Term full and half courses.
T Sep 28	
R Sep 30	No Classes National Truth and Reconciliation Day
T Oct 5	
R Oct 7	Multiple Comparisons Factorial Designs: Main Effects, Interactions, and contrasts – Chapter 14
M Oct 11	Thanksgiving Day, University closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.
T Oct 12	
R Oct 14	Finish remaining content/activities; exam prep
T Oct 19	
R Oct 21	**Midterm exam**
T Oct 26	
R Oct 28	Blocks and ANCOVA – Chapter 13
T Nov 2	
R Nov 4	Within Subjects (Repeated Measures) – Chapter 15 (p. 477-499) Higher Order Within – Chapter 15 (p. 499-513)
Nov 7-13	Term Break No Classes
W Nov 11	Remembrance Day (Observed). University Closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.
T Nov 16	
R Nov 18	Trend analysis
T Nov 23	

R Nov 25	Split-Plot/Mixed Design – Chapter 16
T Nov 30	
R Dec 2	Finish remaining content/activities; exam prep
T Dec 7	
R Dec 9	**Final Exam** Fall Term Lectures End. Last day to withdraw with permission from Fall Term half courses.
Dec 11-22	Fall Final Exam Period

Tentative Lab Schedule

Date	Lab Topic*	Assignment	Due
Sep 10	**Diving into SPSS/R, descriptives**	No assignment	
Sep 17	**Assumptions, normality, t-tests (all)**	Assignment 1	Sep 24
Sep 24	**ANOVA & follow-up tests**	Assignment 2	Oct 1
Oct 1	**Orthogonal contrasts**	Assignment 3	Oct 8
Oct 8	**Factorial ANOVA & follow-ups**	Assignment 4	Oct 15
Oct 15	**Midterm review/Q&A**	No assignment	
Oct 22	**NO LAB (week of midterm)**		
Oct 29	**ANCOVA & blocking** **Midterm exam review with Tom**	Assignment 5	Nov 5
Nov 5	**One-way and Higher Within-subjects Design**	Assignment 6	Nov 19
Nov 12	**NO LAB (Reading Week)**		
Nov 19	**Trend Analysis**	Assignment 7	Nov 26
Nov 26	**Split-Plot/Mixed Design**	Assignment 8	Dec 3
Dec 3	**TBD**		

*Exact topics may be adjusted accordingly throughout semester.

Absence From A Test/Exam

Makeup tests/exams are **NOT** an option without the approval of the instructor. Students who miss a test/exam have up to 48 hours to contact the instructor to ask for a makeup test/exam. It's the instructor's discretion if they will allow a make-up exam. Students who do not schedule a makeup test/exam with the instructor within this 48-hour period forfeit the right to a makeup test/exam. At the instructor's discretion, a makeup test/exam may differ significantly (in form and/or content) from a regularly scheduled test/exam. Once approved by the instructor a makeup test/exam must be written within 2 weeks of the missed test/exam on a day/time scheduled by the instructor. If a student cannot write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam https://www.ucalgary.ca/registrar/exams/deferred-exams.

Travel During Exams

Consistent with University regulations, students are expected to be available to write scheduled exams at any time during the official December and April examination periods. Requests to write a make-up

exam because of conflicting travel plans (e.g., flight bookings) will NOT be considered by the department. Students are advised to wait until the final examination schedule is posted before making any travel arrangements. If a student cannot write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam https://www.ucalgary.ca/registrar/exams/deferred-exams. Students with an exceptional extenuating circumstance (e.g., a family emergency) should contact the Department of Psychology (psyugrd@ucalgary.ca).

Reappraisal of Graded Term Work http://www.ucalgary.ca/pubs/calendar/current/i-2.html

Reappraisal of Final Grade http://www.ucalgary.ca/pubs/calendar/current/i-3.html

Academic Accommodations

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/. Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor. The full policy on Student Accommodations is available at http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf.

Academic Misconduct

For information on academic misconduct and its consequences, please see the University of Calgary Calendar at http://www.ucalgary.ca/pubs/calendar/current/k.html

Instructor Intellectual Property

Course materials created by professor(s) (including course outlines, presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the professor(s). These materials may NOT be reproduced, redistributed or copied without the explicit consent of the professor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

Copyright Legislation

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf) and requirements of the copyright act (https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html) to ensure they are aware of the consequences of unauthorized sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

Freedom OF Information and Protection of Privacy

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary

Student Support and Resources

https://www.ucalgary.ca/registrar/registration/course-outlines

Important Dates

The last day to drop this course with no "W" notation and **still receive a tuition fee refund** is **Thursday, September 16, 2021.** Last day add/swap a course is **Friday, September 17, 2021**. The last day to withdraw from this course is **Thursday, December 9, 2021**.
https://www.ucalgary.ca/pubs/calendar/current/academic-schedule.html#fall2017