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PSYC 615	Analysis of Variance		Fall 2023
Instructor:	Emiko Muraki	**Lecture Location:**	AD 51/53
Phone:	403.818.7708	**Lecture Days/Time:**	R 1:00PM – 3:45PM
Email:	ejmuraki@ucalgary.ca	**TAs:**	Jenelle Morgan jenelle.morgan@ucalgary.ca Jonn Henke jbhenke@ucalgary.ca
Office:	AD 60A	**Lab Location:**	SS018
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 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,) to complete the lab activities.

Prerequisites
Admission to the Graduate Program in Clinical Psychology/ Psychology or by permission of the Instructor.

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.

Supplemental Resources
All students will receive free 6-month access to Datacamp online courses to help develop their data science skills (in particular R). Each course includes short videos and interactive exercises. The use of this resource is optional, however if you are new to data analysis using R you may benefit from courses related to data manipulation, analysis, and visualization in R.

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 brief answer, short answer, and long answer with a problem-solving and application focus. The exam will be administered through D2L at the beginning of the regularly scheduled lecture time 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.

Both 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 12. Includes all material covered up to Friday, October 6.
Exam 2: 35% of final grade; Thursday, November 30. The take-home exam will be cumulative, with emphasis on the material covered after Exam 1.
Lab Assignments: 40% of final grade; see Lab Schedule. Each assignment will be worth 6.67% of your final grade (6 assignments, equal weighting).
*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/legal-services/sites/default/files/teams/1/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 Course Schedule

Lecture Schedule

Date	Topic	Relevant Supplemental Readings
R Sep 7	**First day of lectures** Course Introduction SPINE of Statistics: A Review of the Basics Tests to Compare Between & Within Groups	*Discovering Statistics with SPSS* Chapter 2, Chapter 10, Chapter 12 (pp. 385 – 397) *Discovering Statistics with R* Chapter 2, Chapter 9, Chapter 10 (pp. 399 – 412)
R Sep 14	**Last day to drop a class without financial penalty** ANOVA, Power, Confidence Intervals & Assumptions	*Discovering Statistics with SPSS* Chapter 3 (pp. 87 – 90) Chapter 6 (pp.171 – 203) Chapter 12 (pp. 385 – 397) *Discovering Statistics with R* Chapter 5, Chapter 10 (pp. 399 – 412; pp. 454 – 457)
F Sep 15	**Last day to add or swap a course**	
R Sep 21	Focused tests/Planned Comparisons	*Discovering Statistics with SPSS* Chapter 10, Chapter 12 *Discovering Statistics with R* Chapter 9, Chapter 10
F Sep 22	**Fee payment deadline for Fall Term full and half courses.**	
R Sep 28	Multiple Comparisons Factorial Designs: Main Effects, Interactions, and contrasts	*Discovering Statistics with SPSS* Chapter 14 *Discovering Statistics with R* Chapter 12
S Sep 30	**UNIVERSITY CLOSED National Day for Truth and Reconciliation**	
R Oct 5	Finish remaining content/activities; exam prep	

M Oct 9	**UNIVERSITY CLOSED Thanksgiving Day**	
R Oct 12	**Midterm exam**	
R Oct 19	Blocks and ANCOVA	*Discovering Statistics with SPSS* Chapter 13 *Discovering Statistics with R* Chapter 11
R Oct 26	Within Subjects (Repeated Measures) Higher Order Within *Virtual class	*Discovering Statistics with SPSS* Chapter 15 *Discovering Statistics with R* Chapter 13
R Nov 2	Trend analysis	
R Nov 9	Split-Plot/Mixed Design	*Discovering Statistics with SPSS* Chapter 16 *Discovering Statistics with R* Chapter 14
S Nov 11	**UNIVERSITY CLOSED Remembrance Day (Observed Monday Nov 13).**	
Nov 12-18	**Term Break No Classes**	
R Nov 23	Finish remaining content/activities; exam prep	
R Nov 30	**Final Exam**	
T Dec 5	**Fall Term Lectures End.**	
W Dec 6	**Last day to withdraw with permission from Fall Term half courses.**	
Dec 9-20	**Fall Final Exam Period**	

Lab Schedule

Date	Topic	Assignment	Due
F Sep 8	No lab		
F Sep 15	Diving into R, Descriptive Statistics	No assignment	
F Sep 22	Assumptions, Normality, t-tests	Assignment 1	Sept 29
F Sep 29	ANOVA & Follow-up Tests Planned Comparisons and Orthogonality	Assignment 2	Oct 6
F Oct 6	Midterm review/Q&A		
F Oct 13	No lab (week of midterm)		
F Oct 20	Factorial ANOVA	Assignment 3	Oct 27

F Oct 27	ANCOVA	Assignment 4	Nov 3
F Nov 3	Within-subjects ANOVA & Higher-level Design Trend Analysis	Assignment 5	Nov 10
F Nov 10	Split Plot (Mixed Model Design)	Assignment 6	Nov 24
Nov 12-18	Term Break No Classes		
F Nov 24	Final Exam Review/Q&A		
F Dec 1	No lab (week of final exam)		
Dec 9-20	Fall Final Exam Period		

Absence From Test/Exam
Makeup tests/exams are **NOT** an option without the approval of the instructor
https://www.ucalgary.ca/pubs/calendar/current/g-1-1.html   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 Deferred Final Exams | University of Calgary (ucalgary.ca) 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 https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/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 (https://library.ucalgary.ca/services/copyright?_gl=1*bcjlpn*_ga*OTY1ODc0Njg0LjE2NjkxNTA1NTM.*_ga_X4GN9Y4W7D*MTY3Nzc5MjM3Ni4xNy4xLjE2Nzc3OTI4MDYuMC4wLjA) 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 14th, 2023**. Last day add/swap a course is **Friday, September 15th, 2023**. The last day to withdraw from this course is **Wednesday, December 6th, 2023**.