UNIVERSITY OF CALGARY

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| Psychology 617 | Advanced Research Design and Analysis II | Winter 2024 |

Instructor:	Tom O'Neill	**Lecture Location:**	AD 051/ 053
Phone:	587 893 3759	**Lecture Days/Time:**	R 12:30-3:15
Email:	toneill@ucalgary.ca	**TA:**	Jonn Henke jbhenke@ucalgary.ca
		Lab Location:	SS 018
Office:	Admin 264	**Lab Day/Time:**	F 1:30-4:15
Office Hours:	By appointment	**Office Hours:**	By appointment

Course Description and Objectives

Multivariate techniques and design issues, including correlations, multiple regression, logistic regression, discriminant analysis, MANOVA, linear mixed models with nested and longitudinal designs (e.g., "hierarchical linear modeling"), exploratory factor analysis, confirmatory factor analysis, path analysis, and structural equation modeling. By the end of this course you should have working knowledge of the theory and application of each statistical technique.

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 the Métis Nation of Alberta (Districts 5 and 6).

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. The focus of the lab will be on using R.

Prerequisites
Admission to the Graduate Program in Psychology or by permission of the Instructor. The course material is designed with the assumption that students have completed at least one rigorous undergraduate statistics course in psychology covering the topics covered in this course.

Optional Text
This is optional, and I suggest waiting until after the first class before considering purchasing. Meyers, L. S., Gamst, G., & Guarino, A. J. (2013, 2016). *Applied multivariate research: Design and interpretation* (2nd OR 3rd ed.). Sage.

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.**

Dates and Weighting*:

Exam 1: 25% of final grade; Thursday, April 4. 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. 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 or any other individuals, 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).

Exam 2: 40% of final grade; Thursday, April 4. 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*: 35% of final grade; see schedule below. There will be 7 assignments, each equally weighted within the 35% assigned to this part of the course.
*Students must achieve a passing grade on both the class and lab components to pass this course.

Late assignments and exams will not be accepted without prior instructor approval. But see the late bank for assignments below.

Due by 11:59PM one week after assigned (i.e., Fridays; except for last assignment, 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_initial_Assignment#. **Late assignments will receive a grade of zero 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%**.

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%

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 Jan 11	Course overview, correlation, and other general issues in statistics
F Jan 12	**Lab:** Introduction to SPSS; Correlation
R Jan 18	Multiple Regression
	Last day to drop a class without financial penalty
F Jan 19	**Lab:** Correlation and Multiple Regression*
	Last day to add or swap a course
R Jan 25	Logistic Regression
F Jan 26	**Lab:** Logistic Regression*
	Due: Assignment 1 MR
	Fee payment deadline for Winter Term full and half courses.
R Feb 1	Discriminant Function Analysis and MANOVA
F Feb 2	**Lab:** Discriminant Function Analysis and MANOVA*
	Due: Assignment 2 LR
R Feb 8	Exam Review
F Feb 9	**Lab:** Exam review
	Due: Assignment 3 DFA/MANOVA
R Feb 15	Midterm Exam
F Feb 16	**Lab:** No lab
Feb 18-24	Term Break, no classes
R Feb 29	Multilevel Modeling: Nested Designs
F Mar 1	**Lab:** Multilevel Modeling: Nested Designs*
R Mar 7	Exploratory Factor Analysis
F Mar 8	**Lab:** EFA*
	Due: Assignment 4 MLM Nested Designs
R Mar 14	Confirmatory Factor Analysis: Essentials of Measurement Models
F Mar 15	**Lab:** CFA*
	Due: Assignment 5 EFA
R Mar 21	Path Analysis & Structural Equation Modeling
F Mar 22	**Lab:** Path Analysis & SEM
	Due: Assignment 6 CFA
R Mar 28	Multilevel Modeling: Longitudinal Designs
F Mar 29	**Lab: Exam Review**
	Due: Assignment 7 Path Analysis & SEM
R Apr 4	Final exam
F Apr 5	**Lab:** No lab
T Apr 9	Winter Term Lectures End.
	Last day to withdraw with permission from Fall Term half courses.
Apr 12-23	Winter Final Exam Period

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, January 18th, 2024**. Last day add/swap a course is **Friday, January 19th, 2024**. The last day to withdraw from this course is **Tuesday, April 9th, 2024**.