PSYC*6380, Course Outline: Winter 2024

General Information

DUE to the ongoing COVID-19 pandemic some courses are being offered virtually and some face to face. **This course is offered using the Alternate-Delivery-Synchronous (AD-S) format. There is an assigned day and time for class lectures, but no classroom, because lectures are delivered virtually.**

Course Title: Psychological Applications of Multivariate Analysis

Course Description:

This course starts with bivariate regression as a basis for building a deep understanding of multiple regression (a frequently used multivariate technique). Regression topics include plotting regressions, conducting ANOVA as a regression, comparing regression models, and regression assumptions. Emphasis is placed on understanding evaluating whether regression assumptions are violated and consequences of assumption violations. Assumption violations are used as means understanding the basis for multilevel regression. Time permitting, we also introduce logistic regression.

Credit Weight: 0.50

Academic Department (or campus): Psychology

Semester Offering: W24

Class Schedule and Location: Monday 8:30am Zoom

Instructor Information

Instructor Name: David Stanley, PhD
Instructor Email: dstanley@uoguelph.ca
Office location and office hours: TBA, Zoom classroom link.

GTA Information

GTA Name: Rahul Patel
GTA Email: rpatel40@uoguelph.ca
GTA office location and office hours: TBA, Zoom different Zoom link

Course Content

Specific Learning Outcomes:

1. Literacy. Facet 2. Methodological literacy: the ability to understand, evaluate, and design appropriate methodologies for rigorous psychological science
2. Literacy. Facet 3. Quantitative literacy: includes numeracy, and competence in working with numerical data
3. Literacy. Facet 4. Technological literacy: the ability to select and use appropriate technology
4. Communication. Facet 3. Reading comprehension: the understanding of theoretical and empirical literature in Psychology.
5. Communication. Facet 2. Written communication: the ability to express one's ideas and summarize theory and research through a variety of writing styles (e.g., American Psychological Association style).

Lecture Content:

1. Simple Linear Regression Models
2. Multiple Linear Regression Models
3. The ANOVA Table and Goodness-of-Fit Statistics
4. Comparing Linear Regression Models
5. Indicator Variables in Linear Regression Models
6. Independence
7. Homoscedasticity
8. Collinearity and Multicollinearity
9. Normality, Linearity, and Interaction Effects
10. Model Specification
11. Measurement Errors
12. Influential Observations: Leverage Points and Outliers
13. Multilevel Linear Regression Models (time permitting)
14. A Brief Introduction to Logistic Regression (time permitting)
15. Factor analysis/SEM (time permitting)

In addition to these topics, we will be learning R Markdown. All assignments must be completed with R Markdown. Both the final PDF document and the R Markdown .Rmd file need to be submitted.

Course Assignments and Tests:

Assignment or Test	Due Date	Contribution to Final Mark (%)	Learning Outcomes Assessed
Assignment 1	January 15	8.5%	1, 2, 3, 4, 5
Assignment 2	January 22	8.5%	1, 2, 3, 4, 5
Assignment 3	January 29	8.5%	1, 2, 3, 4, 5
Assignment 4	February 5	8.5%	1, 2, 3, 4, 5
Assignment 5	February 12	8.5%	1, 2, 3, 4, 5
Assignment 6	February 26	8.5%	1, 2, 3, 4, 5
Assignment 7	March 4	8.5%	1, 2, 3, 4, 5
Assignment 8	March 11	8.5%	1, 2, 3, 4, 5
Assignment 9	March 18	8.5%	1, 2, 3, 4, 5
Assignment 10	March 25	8.5%	1, 2, 3, 4, 5
R Cookbook	April 1	8.5%	1, 2, 3, 4, 5

Additional Notes (if required):

Best 9 of 10 Assignments will be used. This is a form of universal accommodation to account for illness, schedule conflicts, conferences, and other personal circumstances. Assignment total is 85% (9 x 8.5% = 76.5%).

R Cookbook. Additionally, you must submit an R Cookbook (8.5%) that is a compilation of the applied/practical R code covered in the class and written by you for your assignments. Code related to theoretical lessons should NOT be in this Cookbook – this in applied manual you are making for yourself. This Cookbook must be written in R Markdown and include a table of contents. Each entry in the table of contents should be a concrete task that your future self will want to accomplish with R for your thesis or other applied research. The table of contents must have at least two levels. Code must be documented so that you can understand what each section of the code does in case you do not remember in the future. Feel free to leave additional notes and comments for "your future self" in the code. You must submit both the rendered PDF of your Cookbook and the .Rmd file. ADVICE: Make this as we work through the course – do not leave it for the end of the year.

The final exam (15%) is cumulative and covers both the textbook material (with related more modern R code on the Regression Text Book Supplement) and the course slides.

Final examination date and time: Monday April 15, 8:30am (online via Courselink)

Final exam weighting: 15% of final grade

Examination Regulations

Course Resources

Required Texts:

Hoffmann, J. P. (2021). Linear Regression Models: Applications in R. CRC Press.
[Publisher's website]

Other Resources:

Regression Text Book Supplement

PSYC 6380 Class Website

R Markdown Introduction. Free online chapter in R for Data Science.

R Markdown: The Definitive Guide. Free online reference book.

Course Policies

Course Concerns

Concerns about any aspect of the course should be raised during office hours – not via email. These issues are too important to use email to address them.

Grading Policies

Where a student is of the belief that an assignment has not been accurately graded, they are to pursue a 2-step course policy: 1) as soon as possible, meet with the TA that graded the assignment, and if a student remains dis-satisfied, 2) they can request from the instructor that the assignment is regraded. Note that the student will be required to accept the re-grade, whether it be higher or lower than the original grade.

Be sure to follow assignment/quiz directions for submissions. Especially around reporting the right number of decimal places for numbers. Assignments are bespoke and marking is partly automated. Remarking requests will not be granted if the grade loss is due to a failure to follow assignment directions (e.g., reporting the right number of decimals etc.).

Please be sure to consult Graduate Grade interpretation. In particular, I draw your attention to the fact a GRADUATE grade in the 80 to 89 range is described as "Very Good to Excellent. The student demonstrated a very good understanding of the material at a level of performance warranting scholarship consideration." Correspondingly, a GRADUATE grade in the 90 and above range is described as "Outstanding. The student demonstrated a mastery of the course

material at a level of performance exceeding that of most scholarship students and warranting consideration for a graduation award."

Course Policy on Group Work:

All assignments must be completed on an INDIVIDUAL basis. Group work is not permitted for any course components – unless specifically noted in the assignment.

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

Disclaimer:
Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email. This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (https://news.uoguelph.ca/2019-novel-coronavirus-information/) and circulated by email.

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:
[Grounds 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](#):

Illness
Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g., final exam or major assignment).

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 [Student Accessibility Services](#) as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 54335 or email accessibility@uoguelph.ca or the [Student Accessibility Services Website](#)

Student Feedback Questionnaire

These questionnaires (formerly course evaluations) will be available to students during the last 2 weeks of the semester: March 25th – April 8th. Students will receive an email directly from the Student Feedback Administration system which will include a direct link to the questionnaire for this course. During this time, when a student goes to login to Courselink, a reminder will pop-up when a task is available to complete.
[Student Feedback Questionnaire](#)

Drop date

The last date to drop one-semester courses, without academic penalty, is Monday April 8, 2024. For regulations and procedures for Dropping Courses, see the [Schedule of Dates in the Academic Calendar.](#)

Instructors must provide [meaningful and constructive feedback, at minimum 20% of the final course grade, prior to the 40th class day](#). For courses which are of shorter duration, 20% of the final grade must be provided two-thirds of the way through the course.

[Current Graduate Calendar](#)