Regression
Psychology 754
Spring 2020

Class -003: Monday and Wednesday 1:30-2:45pm (Class will be online and asynchronous)
Class -004: Monday and Wednesday 10:30-11:45pm (Class will be online and asynchronous)

Instructor: Jeff Stuewig (jstuewig@gmu.edu)
Office Hrs: M 11-11:15; W 2:00-2:15, or by appt. Zoom link will be posted on Blackboard in the folder where the syllabus is posted.

Labs -003: F 8:30am-10:20am F 10:30am-12:20pm

Teaching Assistant: Tiancheng (Allen) Chen (tchen22@gmu.edu)
Office Hrs: Fridays 9:30 - 11:30 or by appt Link will be posted on Blackboard

Labs -004: F 12:30pm-2:20pm F 2:30pm-4:20pm
Teaching Assistant: Nicole White (nwhite21@gmu.edu)
Office Hrs: Fridays 2:00 - 3:00 or by appt Link will be posted on Blackboard

Technology:

Official Communications via GMU E-mail: Mason uses electronic mail to provide official information to students. Examples include communications from course instructors, notices form the library, notices about academic standing, financial aid information, class materials, assignments, questions, and instructor feedback. Students are responsible for the content of university communication sent to their mason e-mail account, and are required to activate that account and check it regularly.

Blackboard: Activities and assignments in this course will regularly use the Blackboard learning system, available at https://mymason.gmu.edu. Students are required to have regular, reliable access to a computer with an updated operating system (recommended: Windows 10 or Mac OSX 10.13 or higher) and a stable broadband Internet connection (cable modem, DSL, satellite broadband, etc.).

Web-conferencing: Activities and assignments in this course will regularly use web-conferencing software (Zoom). In addition to the requirements above, students are required to have a device with a functional microphone and camera.

Course Materials and Student Privacy: All course materials posted to Blackboard or other course site are private to this class; by federal law, any materials that identity specific students (via their name, voice, or image) must not be shared with anyone not enrolled in this class. Video recordings – whether made by instructors or students – of class meetings that include audio, visual, or textual information from other students are private and must not be shared outside the class. Live video conference meetings (e.g., Zoom or WebEx) that include audio, textual, or visual information from other students must be viewed privately and not shared with others in your household or recorded and shared outside the class. All of our synchronous meetings in this class will be recorded to provide necessary information for students in this class. Recordings will be stored on Blackboard and will only be accessible to students taking this course during this semester.

Description of Course:
The purpose of this course is to fully immerse graduate students into regression as an applied statistical tool. You will learn about the General Linear Model (GLM) and the Generalized Linear Model (GLiM) as well as different techniques that fall under them. We will start, and spend the majority of the semester, with standard linear regression and how to use it to answer a variety of questions including mediation and moderation. We will cover assumptions and diagnostics of regression and what to do when things go awry. Given time, we will also delve into logistic regression, poission regression and random coefficient modeling. In this course we aim to provide you with flexible research skills that will help you to meet common challenges, whether your goal is to do quality work in basic research or applied domains.

Throughout the semester, you will gain hands-on experience through a number of different projects, learning how to draw statistical and substantive conclusions from the results of various analyses. You will often be asked to prepare a written summary of results using APA style, fine-tuning your ability to communicate substantive results to professional audiences. A word of warning, there is a very high workload in this class, so be prepared to devote a substantial amount of time to reading, homework, projects, and studying. A second word of warning, this is an ***advanced*** statistics course.

Course Requirements:
There are certain knowledges and skills that I expect you to have coming in to the course. I expect a reasonable understanding of variance and simple (i.e., single independent variable) regression. The course will begin with an overview, but it will go quickly. If you are unfamiliar with regression and do not have a good understanding of variance, this may not be the proper place to get acquainted.

I also expect some degree of facility with computers and data analysis. The projects will involve the manipulation and analysis of various data sets. If you are unfamiliar with SPSS, SAS, or R, this is not the class for you. Also, while I don't really care which analysis package you use, I will use SPSS. Although I have worked with SAS and R, I am not familiar enough with them to be able to answer specific questions about running analyses with them. I am also not familiar enough with them to know the types of output that one can get from them.

The course requirements for this include: (1) attendance/participation in class; (2) Lab (which include lab assignments); (3) twelve quizzes, of which two can be dropped; and (4) six homework assignments, of which one can be dropped.

Grades will be determined as follows:

40% Homework assignments (you will be required to perform data analyses on a data set that I will provide and then write up the analyses in APA style as if it was part of a results section in a journal article. There also may be additional questions I will want you to answer about the analysis, this will be separate from the write up. These homework assignments need to be done in pairs. You can choose your partner. I encourage you to run the analyses and answer the questions separately. Then write it together. When submitting the write up I would like you to name the file to reflect last name of each student, project number, and which class you are in. For example "Stuewig Chen Project3 Class003.docx". There will be 6 of these assignments, one of which can be dropped. At this point the plan is to let you rewrite and resubmit these assignments, for which you can receive a higher grade.

40% There will be 12 quizzes throughout the semester administered through Blackboard. You will have 15 minutes to complete them. You are allowed to drop two of the quiz grades. There will be no makeup quizzes. If extenuating circumstances prevent you from a taking a quiz by the scheduled deadline, then this is the quiz you drop. I sometimes give extra credit, but there will be no scores above 100% for the total of all quizzes.

20% Laboratory participation, do the assignments, turn them in on time. Assignments will be posted on BB during lab time. They will be due **before** the next lab. You will be docked 5% for everyday it is late. Assignments will not be accepted after 1 week late. You may drop one lab assignment.

Final grades will be assigned according to the following percentages: A = 94-100 A- = 90-93 B+ = 87-89 B = 83-86 B- = 80-82 C+ = 77-79 C = 73-76 C- = 70-72 F = below 70

Honor Code:
George Mason University has an Honor Code, which requires all members of this community to maintain the highest standards of academic honesty and integrity. Cheating, plagiarism, lying, and stealing are all prohibited. It is every student's responsibility to familiarize himself or herself with the Honor Code. The Honor Code is available at: https://oai.gmu.edu/mason-honor-code/
All violations of the Honor Code will be reported to the Honor Committee. The instructor for this course reserves the right to enter a failing grade to any student found guilty of an honor code violation.

Class Cancellation Policy:
This class will entail frequent use of email. Please check your email regularly. Also make sure that you check for announcements on Blackboard. Since we are online, I don't anticipate that there will be any week where we won't have class.

Accommodation Of Disabilities:
Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. Note that this provision includes the range of disabilities, including physical, psychiatric, and learning disabilities. If you are seeking accommodations for this class, please first visit http://ds.gmu.edu/ for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. All academic accommodations **must** be arranged through Disability Services. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu | Phone: (703) 993 – 2474.

Sexual Harassment, Sexual Misconduct, And Interpersonal Violence:
As a faculty member and designated "Responsible Employee," I am required to report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's Title IX Coordinator per university policy 1202. If you wish to speak with someone confidentially, please contact the Student Support and Advocacy Center (703-380-1434) or Counseling and Psychological Services (703-993-2380). You may also seek assistance from Mason's Title IX Coordinator (703-993-8730; titleix@gmu.edu).

Student Support Services:
George Mason offers services to support students' academic and emotional development. Counseling and Psychological Services, located in SUB I room 3129 (caps.gmu.edu), offers workshops in academic skills, stress management training, and virtual counseling for students who would like some help with social, emotional, or educational concerns. Consider taking advantage of these resources if you need them. For additional information about other student support services offered, visit: https://stearnscenter.gmu.edu/knowledge-center/knowing-mason-students/student-support-resources-on-campus/

Recommended Texts:
Cohen, J. Cohen, P, West, S.G., Aiken, L,S. (2003). Applied multiple regression/correlation analysis for the behavioral sciences (3rd ed.). Mahwah, NJ: Erlbaum. – If you are going to be doing a lot of regression in your work, I highly recommend buying this book.

Lewis-Beck, C. & Lewis-Beck, M.S. (2015). *Applied Regression: An Introduction. Second Edition*. Thousand Oaks, CA: Sage. (Sage University Paper Series on Quantitative Applications in the Social Sciences, No. 22). – Available electronically through the library.

Required Articles and Chapters**:** (Will be available online)
*Specific articles or chapters will be assigned as the semester progresses.

Alkharusi, Hussain. (2012). Categorical Variables in Regression Analysis: A Comparison of Dummy and Effect Coding. International Journal of Education. 4. 202-210. 10.5296/ije.v4i2.1962.

MacKinnon, D. P., Cheong, J., & Pirlott, A. G. (2012). *Statistical mediation analysis.* In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbooks in psychology®. APA handbook of research methods in psychology, Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological* (p. 313–331). American Psychological Association. https://doi.org/10.1037/13620-018

Frazier, P. A., Tix, A. P. & Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counseling Psychology, 51,* 115-134.

Woltman, H., Feldstain, A., MacKay, J. C., & Rocchi, M. (2012). An Introduction to Hierarchical Linear Modeling. *Tutorials in Quantitative Methods for Psychology, 8,* 52-69.

Optional Texts and Readings:
American Psychological Association. (2009). *Publication manual* (6th ed.). Washington, D. C.: American Psychological Association. (APA)

Berry, W.D. (1993). *Understanding regression assumptions*. Newbury Park, CA: Sage. (Sage University Paper Series on Quantitative Applications in the Social Sciences, No. 92). – Available electronically through the library.

Darlington, R. B. & Hayes, A. F. (2017). Regression analysis and linear models: Concepts, applications, and implementation. New York, NY; The Guilford Press.

*Other articles or chapters may be suggested as the semester progresses.

Tentative Course Outline
Students are responsible for being aware of **any changes** in this schedule announced in class, lab, or over email.

Last day to **add** classes: February 1, 2020
Last day to **drop** classes with no tuition penalty: February 12, 2020
Last day to **drop** classes with 50% penalty: February 16, 2020
Spring Break: No spring break.

TENTATIVE SCHEDULE (Subject to change)			
Week	**Date**	**Topics**	**Readings available on Blackboard (Supplemental/optional readings also listed on Blackboard)**
1	M 1/25 W 1/27	Overview of Course. Intro to basic statistics. Covariance & correlation	
2	M 2/1 W 2/3	Simple Linear Regression	Lewis-Beck Ch. 1
3	M 2/8 W 2/10	Multiple Regression	Lewis-Beck Ch. 3
4	M 2/15 W 2/17	Assumptions and Diagnostics	Lewis-Beck Ch.2
5	M 2/22 W 2/24	Categorical IVs in Regression	Alkharusi
6	M 3/1 W 3/3	TBD	
7	M 3/8 W 3/10	Moderation	Frazier, Tix, & Barron, p. 115-125
8	M 3/15 W 3/17	Moderation Higher order interactions	
9	M 3/23 W 3/24	Moderation with Categorical Vars Mediation	Rest of Frazier, Tix, & Barron; MacKinnon et al., p. 313 to top of page 321 (can stop at the "longitudinal mediation models" header)
10	M 3/29 W 3/31	Mediation Moderated Mediation	Look at section in MacKinnon et al.
11	M 4/5 W 4/7	Even more complicated models Random Coefficient Modeling	Woltman et al.
12	M 4/12 W 4/14	Random Coefficient Modeling Dichotomous DV	TBD
13	M 4/19 W 4/21	Logistic Regression	TBD
14	M 4/26 W 4/28	Count Data and wrap up	TBD