

## ED PSY 820: Multiple Regression and Other Linear Models

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- I do my very best to respond to email within a day during regular business hours. If you do not get a response from me within a couple of work days, please feel free to follow up with a reminder. Note that I may not check and respond to email in the evenings or on weekends.
- Please do check the Canvas course page before emailing to see if the information is posted there. For example, if I already received some questions about a homework problem, I may have posted clarifications on Canvas. If you cannot find the information, feel free to send me an email.

**Office Hours:** Please **contact me by e-mail to set up a time** to meet, as necessary.

- We can meet in person, online, or speak by phone.
- Please let me know at least a day or two in advance of when you would like to meet so we can set up a mutually convenient time and modality.

**Course Objectives:** This course is designed to provide students with a solid overview of basic and advanced topics in regression analysis. The course will be taught from an applied perspective, and the objectives are to enable students to:

- Identify how to properly use regression analysis to address research questions of interest with a particular dataset;
- Use statistical software to appropriately analyze the data and interpret the statistical information;
- Clearly communicate the results of the statistical analyses to address the research questions of interest.

By the end of the course students should be able to identify the regression analysis most appropriate for a given research question and data set, carry out the analysis, and properly interpret the results. Students will be exposed to regression models and analyses that they may need to use in their own research or encounter in reading research articles.

**Pre-requisites:** A graduate-level statistics course such as ED PSY 724 that included simple (and possibly multiple) regression, factorial ANOVA, and statistical computing.

**Textbook:** Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). **Applied multiple regression / correlation analysis for the behavioral sciences, 3<sup>rd</sup> ed.** Mahwah, NJ: LEA.

- You may find it useful to have and refer to the textbook during class meetings.
- Other readings and (optional) books will be listed on the course web page.

**Computing:** Students will be required to use some statistical software packages (e.g., SAS or SPSS).

Students are expected to be **already proficient** in at least one software package. The demonstrations and examples provided will focus on the use of SAS. Students who wish to use other software are welcome to do so on their own.

- UWM provides access to the software (e.g., SAS or SPSS) at campus computer labs and remote access through UWM's Remote Lab Access. Further software access information and instructions can be found on the course Canvas site under "**General Computing Resources**".
- Please be aware that I will be able to help you most with SAS. If you want to use another software package, you will need to figure out how to obtain the correct results with that package.

**Course Web Site and Delivery:** This course will make extensive use of its **Canvas** site.

- The Canvas site can be accessed at [UWM Canvas Home](#) and instructions/support for using Canvas are available at [Student Canvas support](#).

- Students are expected to check the site on a regular basis for announcements, notes, assignments, discussions, and any other course information.
  - You can specify your [preferred notification settings](#) in Canvas. I recommend that you enable the notifications for the Announcements, at least.
- I will plan to post the materials, including **notes** (with and without a voice-over recording), no later than Monday of each week. If updates were needed since the recordings were made, the notes documents may be updated and may differ slightly from those in the recording. The notes also include **learning checks** (not counted towards the course grade) that you are encouraged to do to check your understanding prior to the class meetings and before starting the homework assignments (which will count towards the course grade).
  - Students are expected to review the notes (and attempt the learning checks) each week **prior** to the class meeting.
- We will meet on **Thursdays at 3:30 pm** (in our assigned classroom).
  - Please plan to attend the classes **in person** as much as possible. I will try to make remote participation (through zoom) available, but I highly encourage you to attend class meetings in person and recommend that you attend remotely only when absolutely necessary rather than just for convenience.
  - In the class meetings I will summarize the material, provide clarifications, answer your questions about any of the material (including assignments and learning checks), and discuss any other course information.

### Course structure and student evaluation:

- **Homework:**
  - Homework problem sets will typically be **assigned every week** (based on that week's material) and will be submitted on Canvas every few weeks. The assignments will generally be due on Thursdays, approximately every 2-3 weeks. Specific due dates will be posted on Canvas. (Note that assignment points may show up as 0 on Canvas but this will be updated once assignments are posted/graded.)
  - Late homework assignments will be accepted with a **10% point deduction** for each day they are late (in other words, you will lose 10% of the total number of points for the assignment for each day it is late, including weekend days). This penalty may be reduced or exempted if the reason for late submission is acceptable to the instructor, so ***please communicate with me (the instructor) if there are extenuating circumstances and/or your homework will be late.*** It is preferable that you submit an assignment that reflects **your best work** and is a bit late than one that does not reflect your best work but is on time.
  - The homework assignments will consist of problems that are intended to give you some hands-on practice with the material. You will need to make sure that you are clearly communicating your understanding in your answers (see also the **General Homework Guidelines** document posted on Canvas).
  - Each problem (or major component) will be graded on a three-point scale to indicate the level of accuracy and understanding reflected in it:
 

Points	Description
3	Complete, clear and correct.
2	Some mistakes and/or misconceptions, somewhat unclear or incomplete.
1	Many mistakes and/or misconceptions, very unclear or incomplete.
0	Not done or barely attempted.
  - Homework grades and comments are designed to provide you with feedback on the level of understanding conveyed in your assignment. If you find the feedback insufficient, it is **your responsibility** to make sure that you ask and understand it.

- Do not put off getting help if you don't know how to do a homework problem or do not understand the feedback you received on it. Better yet, if you don't understand how to do a problem, ask before the assignment is submitted. (Note that I will not “pre-grade” your answers but will be happy to clarify anything that is unclear to you.)
- Please feel free to post any questions (or helpful information for other students) in the Discussions area on Canvas.
- A note on working with others (or AI): The goal of the homework assignments is to make sure you are learning and understanding the material, so it would defeat the purpose if you get the right answer without really understanding why. Thus, while you are allowed to discuss the concepts on homework assignments, it is recommended that you complete the assignments on your own. In addition, **the work you submit must be your own**, and it is considered academic misconduct to submit anyone else's work (or words) as your own.
- **Exams:**
  - There will be one midterm exam as well as a final exam. These will be “take-home” exams.
  - The midterm exam will be due around the middle of the course (date will be clearly posted on Canvas) and the final exam will be due during finals week.
  - Students must **complete the exams independently** and with the utmost regard for **academic integrity** (i.e., exams should be treated as if they are in-class). Students will **not** be allowed to collaborate or discuss the exams with anyone (other than the instructor), and violations of this will be considered academic misconduct.

The weights assigned to each of the components will be:

<b>Homework</b>	<b>25%</b>
<b>Mid-term exam</b>	<b>35%</b>
<b>Final exam</b>	<b>40%</b>

*There will be NO extra credit option in this course.*

Using these weights, final scores (out of 100) will be computed and these will be converted to letter grades as follows:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
90-100	85-89	80-84	75-79	70-74	67-69	63-66	60-62	57-59	53-56	50-52	below 50

### Academic Integrity:

- It is better to receive an honest grade on your own work than to risk committing plagiarism or academic misconduct. If you are unsure on what is acceptable, or need help, please ask.
  - At this point and for this course, submitting work as your own that was generated by AI will be considered plagiarism.
- Excerpts from [UWM's Academic Integrity Online page](#):
  - Ask your instructor if you are unsure about how to complete an assignment or course requirement appropriately.
  - When collaborating with other students, collaborate for a better understanding of the material, not for answers. *Note that no collaboration of any kind is allowed on the exams in this course.*
  - If you are unable to complete assignments, the instructor may be flexible with the deadlines, and receiving a late penalty is far better than academic dishonesty.
- There is additional information and resources for avoiding plagiarism at [Plagiarism.org](#)

**University Policies:** Policies regarding participation of students with disabilities, accommodations for religious observances, academic misconduct, student complaints, grade appeals, sexual harassment, attendance, assignment of a grade of "incomplete", etc., are available at this [Syllabus Links document](#). *Students should review these policies at the start of the course.*

**Time Investment:** This will vary by student and by week, but my expectation is that students will spend a total of about 150 hours on the course (as would be the case for an in-person 3-credit course). This [document](#) provides a more detailed breakdown. This is an estimated workload and students will be assessed on their performance (as indicated in the syllabus), not on the time put into the course.

**A note about cell phones:** As a courtesy to the instructor and your fellow students, *please turn OFF your cell phone ringer* during class.

### TENTATIVE SCHEDULE

Week	Date	Topic	Reading
1	Sept. 7	Introduction & Review of Correlation and simple regression	Chapters 1-2
2	Sept. 14	Descriptive multiple regression: two-predictor models	Sections 3.1-3.4
3	Sept. 21	Inference in multiple regression models	Sections 3.5-3.8
4	Sept. 28	Formulation of multiple regression models: a brief introduction to matrix algebra	Appendix & TBA
5	Oct. 5	Assumptions of regression analysis	Chapter 4
6	Oct. 12	Diagnostic measures: Outliers and multicollinearity	Chapter 10
7	Oct. 19	Data analytic strategies: variable sets and comparisons ➤ <b>Midterm Exam available</b>	Sections 5.1-5.7
8	Oct. 26	Data analytic strategies, continued	Sections 5.1-5.7
9	Nov. 2	Nonlinear regression	Chapter 6
10	Nov. 9	Interaction between continuous predictors	Chapter 7
11	Nov. 16	Categorical independent variables	Chapter 8
12	Nov. 23	~ Thanksgiving week ~	
13	Nov. 30	Interaction between categorical and continuous variables	Chapter 9
14	Dec. 7	Mediation models ➤ <b>Final Exam available</b>	Sections 12.1-12.3
15	Dec. 14	Introduction to logistic regression; Course review	Section 13.2
Finals week		➤ <b>Final exam due</b>	

➤ *Note: The due date for each exam is anticipated to be two weeks from the day it is made available.*