Correlation and Regression

Instructor: Osvaldo F. Morera, PhD
Office: Room 212
Phone: 747-5417
Office hours: Thursdays from 10:00 am – 11:50 am and by appointment
Email: omorera@utep.edu

TA: 
Email:

Lectures: 3:00 pm – 4:20 pm; TR, WORR 205


Course Objective:

After this course, you should have a solid foundation in correlation and regression. You should also be able to effectively use multiple regression and other correlational techniques for your research. You will also know about the ‘state of the art’ procedures when it comes to assessing mediation, moderation and moderated mediation. You will also know that analysis of variance is a special case of regression and that regression is a general data analytic system.

Course Prerequisites:

It is expected that you will have had the equivalent of Psychology 4317: Advanced Statistics. If you have not had this class, please consult your advisor about taking this course.

Evaluation:

Course grades will be based on points earned from the following sources:

- Homework assignments 22%
- Midterm Exam 1 26%
- Midterm Exam 2 26%
- Cumulative Final Exam 26%
Homework:

Homework problem sets will usually be passed out during class and due 1 to 2 weeks later (depending on the length of the assignment). Late homework assignments will not be accepted. If computer output is required for the homework, include only the part which is necessary for the solution and edit out any irrelevant output. Computer packages that will be used is SPSS. You can access SPSS in the Vinson Laboratory, located in the Psychology Building. You should also ask your mentor to install the PROCESS macro on the computers in your labs, as later homework assignments will require the use of PROCESS (see more later).

Evaluation

Scores between an 85.0% and 100% guarantees an A. Scores between a 70.0% and an 84.99% will guarantee a B. Scores between 60.0% and 69.99% will guarantee a C. Scores between 50.0% and 59.99% will guarantee a D. Scores below a 50% will guarantee a F.

I may also incorporate a curve to evaluate you. My curving is based on how you perform relative to everyone else in the class. I specifically look for gaps in the distribution of scores to distinguish "A" students, "B" students and, if necessary, "C", "D" and "F" students. I will try to look for gaps in such a way such that the person earning the highest B is closer to the person earning the second-highest B than the person earning the lowest A. A similar strategy is adopted to distinguish between students earning a B and C and so on.

There will no opportunity to improve your grade in the class after you have taken the final examination, so please refrain from asking to do additional assignments after you have completed the course.

Policy on Auditors

Student and faculty auditors are welcome in the class, as long as they complete the required university audit form. However, my first priority is to the students who are registered for the class. Students in the class get first dibs on seats in the class. I also ask that auditors not submit any homework assignments or take any exams, as it is extra work on my part and the TA's part. If your attendance becomes sporadic, I expect that you will not slow down the class with questions that were covered in prior lectures.

In short, your completion of the university audit form allows you the privilege of listening to the course material (and that is all). If your attendance requires additional time of my TA, additional time of myself or takes away from the learning experience from the registered students in the class, you should not audit this class.

Course structure and requirements:

1. Students will be responsible for all material covered in lectures, class handouts and assigned readings. With regard to lectures, there is no such thing a stupid question. If you have a question, someone else probably has that same question. Feel free to ask any questions.
2. Make-up exams will be given only under extraordinary circumstances, such as documented sickness, hospitalization or death of a family member (funeral card required). In some other cases, exceptions will be made if advance notice of absence is provided.

3. There will be two mid-term exams and a final exam. The midterm exams will cover material in the assigned readings, lectures and handouts. Although the midterm exams may have a different number of points on the exam, they will be equally weighted. The final examination will be comprehensive. The examinations will be closed-book and closed-notes. You will be able to bring in 2 pages of “crib sheets” to each midterm exam and 6 pages of “crib sheets” to the final exam.

4. A calculator is highly recommended. It should perform all basic mathematical operations and should have several memories.

5. There will between 7 and 10 homework sets. Many of the homework assignments will require running statistical software. We will use SPSS in this class, which can be used on the machines in Room 212 of the Psychology Building. In addition, we will use the PROCESS macro from Dr. Andrew Hayes’ website (www.afhayes.com). PROCESS can also be found at www.processmacro.org. We will also be using some online tools that can be found at www.quantpsy.org.

I would strongly recommend bookmarking these links to your computer. Please ask your mentors to install PROCESS in your lab, as I am no longer checking the computers in the Vinson Lab to see if they have PROCESS or not. Please do this now rather than later. Finally, I may also use MPlus in some examples in class. The computers that have MPlus on them in the Vinson Lab have a “LISREL” tag on them and those computers are: dbvlab18 (utep tag #132801), dbvlab20 (utep tag #132803), dbvlab21 (utep tag #132796), and dbvlab23 (utep tag #132798).

6. Please turn off all pagers, beepers and other electronic devices before entering class. They are a distraction to other students in the class and to the professor.

7. Office Hours and Appointments: If you have questions concerning the topics of this course, you can stop by to see me during my office hours or you can make an appointment to see me. If you stop by my office and you do not have an appointment to see me, I will ask you to schedule an appointment to see me and I will answer your question during that appointed time. This policy also applies to students who come to my office door with “questions that will only take a minute to answer.” This same standard will also apply for your interactions with the teaching assistant.

8. Conduct of Graduate Students: Students enrolled in this course are graduate students and I have certain expectations of graduate students. As you are pursuing an advanced professional degree, I expect that you will act in a professional manner. Asking for extensions on assignments because you are busy with other courses/projects/papers/conference presentations is not professional. In addition, I also expect that you will show respect for everyone in the class.
9. **Academic Misconduct:** The University has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion of their own work, for the appropriate citation of sources, and for respect of others’ academic endeavors.

In other words, plagiarism, cheating and academic dishonesty will not be tolerated in this class. Plagiarism consists of using another person’s ideas, words, or assistance, while failing to acknowledge this person. If you must submit someone else’s work as if it were your own, you must acknowledge the original author/original source. As you may be asked to write sections of homework problems in a way that would be communicated in a professional journal (i.e, summarize your results for a Results section in a paper submitted to the Journal of Behavioral Decision Making), it is your responsibility to know what constitutes plagiarism.

Information on plagiarism and academic dishonesty can be found at [http://www.utep.edu/dos/acadintg.htm](http://www.utep.edu/dos/acadintg.htm) If I suspect any incidence of academic dishonesty on the homeworks or the exams, I will be more than happy to forward any suspected material to Dean of Students Office.

10. If you have an identified disability that may affect your performance in this class, please see the instructor (no later than the second class) or contact the Center for Accommodations and Student Services (CASS) in Room 106 of the Student Union (phone 747-5148) such that provisions can be made to ensure that you have an equal opportunity to meet all the requirements of this course.

11. I have also assigned supplemental readings. You are responsible for reading these papers, as I may ask questions concerning these readings on homework assignments and/or examinations. These readings can be found in the Main Office of the Psychology Building or they may be emailed to you. Additional readings may be added to the list during the semester.

Tentative Class Schedule

The following chapters from the Cohen et al., (2003) will be covered in the following order.

- Chapter 1: Overview/Review
- Chapter 2: Simple Linear Regression
- Appendix 1 & 2: Matrix Notation and Finding Determinants of Matrices
- Chapter 3: Multiple Linear Regression
- Chapter 4 & 10: Regression Diagnostics
- Chapter 5: Multiple Regression with Sets of Independent Variables
- Chapter 7 and 12: Interactions Among Continuous Variables and Mediation
- Chapter 8: Categorical Independent Variables and Multiple Regression
- Chapter 6: Nonlinear Regression
- Chapter 13: Logistic Regression
## Tentative Course Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>OFM Handout Number</th>
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<tbody>
<tr>
<td>8/23, 8/25</td>
<td>Review, Pearson Correlation, Types of Correlations</td>
<td>Lectures 0 - 2</td>
</tr>
<tr>
<td>8/30, 9/1</td>
<td>Simple Linear Regression, Regression to the Mean</td>
<td>Lectures 3 + 4</td>
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<tr>
<td>9/6, 9/8</td>
<td>Strength of association, Inferential Testing</td>
<td>Lectures 4 - 5</td>
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<td>Null Hypothesis Significance Testing, Power</td>
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<td>9/13, 9/15</td>
<td>Influences on Correlation, Matrix Algebra</td>
<td>Lectures 5 - 6</td>
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<tr>
<td>9/20, 9/22</td>
<td>Gauss-Markov, Multiple Linear Regression (MLR)</td>
<td>Lectures 7-8</td>
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<td>9/22</td>
<td>MIDTERM 1</td>
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<tr>
<td>9/27</td>
<td>Semi-partial and Partial Correlations</td>
<td>Lecture 9</td>
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<tr>
<td>10/4 - 10/6</td>
<td>MLR with k IV’s, Extra SS principle</td>
<td>Lect. 10 - 13</td>
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<td>Inferential testing, multicollinearity</td>
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<td>10/11- 10/13</td>
<td>Power, cross-validation, Model assumptions</td>
<td>Lect. 13 - 16</td>
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<td>10/18 - 10/20</td>
<td>Variable selection methods, hierarchical linear reg.</td>
<td>Lect. 17 - 18</td>
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<td>10/25</td>
<td>MIDTERM 2</td>
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<tr>
<td>10/27</td>
<td>Sets of IV’s, Interactions among continuous IVs</td>
<td>Lect. 19 - 20</td>
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<td>11/1 - 11/3</td>
<td>Centering and probing of interactions, Mediation and moderation</td>
<td>Lect. 21 - 22</td>
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<td>11/8 – 11/15</td>
<td>Coding of Categorical IVs, ANOVA and regression</td>
<td>Lect. 23 - 25</td>
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<td>11/17 - 11/22</td>
<td>Interactions among categorical IV’s, ANCOVA</td>
<td>Lect. 26 – 28</td>
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<td>More regression diagnostics</td>
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<td>11/24</td>
<td>Thanksgiving Day: No class</td>
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<tr>
<td>11/29- 12/1</td>
<td>Multicollinearity, Nonlinear regression, logistic regression</td>
<td>Lect. 28 - 30</td>
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**FINAL EXAMINATION THURSDAY DECEMBER 8, 4:00 PM - 6:45 PM**
Course Readings Outside of the Text:

*Review and Matrix Algebra (file names denoted NWK1 and NWK6)*


*Problems with Null Hypothesis Significance Testing*


*Dichotomizing and Discretizing Continuous Independent Variables*


Lynch, JG, McClelland, G, Irwin, JR, Spiller, SA. & Fitzsimons, GJ (2015, September) Tis Not, Tis Not – Tis So, Tis So: Rebuttal of Rebuttal by Iacobucci, Posavac, Kardes, Schneider, and


*Power and Sample Size in Multiple Regression*


*Mediation Papers*


Important Dates to Remember

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<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Wednesday, September 7</td>
<td>Census Day; Last day to drop course without “W” appearing on transcript</td>
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<tr>
<td>Thursday, September 22</td>
<td><strong>Midterm 1</strong></td>
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<tr>
<td>Tuesday, October 25</td>
<td><strong>Midterm 2 (this exam may be pushed back 1 week)</strong></td>
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<tr>
<td>Friday, October 28</td>
<td>Course drop deadline</td>
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<tr>
<td>Thursday, December 1</td>
<td>Last Day of our class</td>
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<tr>
<td>Thursday, December 8</td>
<td>Cumulative Final Exam (4:00 pm - 6:45 pm)</td>
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<tr>
<td>Wednesday, December 14</td>
<td>Grades due to Records Office</td>
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