Structural Equation Modeling

Instructor: Dr. Edward “Ed” Ramirez  
Class Time: 9 to 11:50 am; Monday  
Classroom: COBA 307  
Phone: 404-732-4891  
Email: eramirez29@utep.edu  
Office: COBA 214  
Office hours: 12 to 1:30 pm; Monday

Course Description

The purpose of this course is to deepen your understanding of research methods, while introducing you to more advanced GLM/covariance-based techniques. Broadly speaking, it focuses on the general linear model, structural equations modeling (SEM), and includes an introduction to network analysis. We will be using SPSS, SAS, AMOS, and UCInet software packages. Since I believe that the ultimate goal of a PhD program is to equip you to become scholars and faculty members, priority will be given to tools and techniques that will help you to publish scholarly research articles.

Course Objectives

While this course focuses on the analysis of data derived from surveys, you will be able to analyze secondary datasets with the techniques presented as well. As such, we will explore how researchers deal with dichotomous outcome variables, latent constructs, and relational versus attribute data, for example. Upon completion of the course, you should have a firm foundation on the following areas:

1. Data types, data cleansing, etc. Basic statistical analysis.
2. ANOVA/ANCOVA MANOVA/MANCOVA
3. Regression Modeling
4. SEM/PLS
5. Interdependence Techniques—Cluster Analysis
6. Network Analysis Basics

Texts

(1) Structural Equation Modeling with AMOS by Barbara M. Byrne (Erlbaum and Associates).
(2) Applied Multivariate Techniques by Subhash Sharma, University of South Carolina  
(3) Discovering Statistics Using SPSS (Introducing Statistical Methods) by Andy Field
(4) Multivariate Data Analysis (6 or 7th Edition) by Joseph F. Hair Jr., William C. Black,  
Barry J. Babin, Rolph E. Anderson.
(5) Social Network Analysis: A Handbook by John P. Scott
(6) Selected readings.

Seminar Structure

This seminar is fast paced and its work load is heavy. That said, although the course is manageable, you should be challenged by it. The seminar format is highly informal and primarily discussion based, where students will be prepared to discuss class readings and/or slides and play the lead role in the learning process. To facilitate discussion, students are expected to have carefully read each assigned reading and completed each assignment prior to class. I expect your best work—and, believe it or not, I don’t like to hear myself talk. Thus, be encouraged to read each reading carefully, so that you will be able explain it if called upon.

Course Requirements

Grading

These components will determine your grade.

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Class Participation</td>
<td>33.3%</td>
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<tr>
<td>Class Assignments</td>
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<tr>
<td>Final Examination</td>
<td>33.3%</td>
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Academic Honesty

Academic dishonesty is not condoned nor tolerated at UTEP or in this class. Such dishonesty, when evidenced, will be reported to the Student Judicial Affairs Office at UTEP. Read UTEP’s website for more information about sanctions. Academic dishonesty is behavior in which a deliberately fraudulent misrepresentation is employed in an attempt to gain undeserved intellectual credit, either for oneself or for another. It includes, but is not necessarily limited to, the following types of cases: **Plagiarism** - The representation of someone else's ideas as if they are one's own. **Unauthorized Collaboration on Out-of-Class Projects** - The representation of work as solely one's own when in fact it is the result of a joint effort; **Cheating on Exams** - The covert gathering of information from other students, the use of unauthorized notes, unauthorized aids, etc.; and **Knowing Cooperation with Another Person in an Academically Dishonest Undertaking** - Failure by a student to prevent misuse of his/her work by others.

Accommodations for Students with Disabilities (from the Office of the Ombudsman)

If any member of the class believes that s/he has a physical, emotional, or psychological disability and needs accommodation of any nature, contact the Disabled Student Services Office at 747-5148, go to the Union Bldg. east, Rm. 106 or email dss@utep.edu. Then notify the
instructor immediately and he will work with the student to assure s/he has a fair opportunity to perform at his/her normal capabilities in the class.

## Tentative Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topics/Readings</th>
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<tbody>
<tr>
<td>1/23</td>
<td>Preliminaries</td>
</tr>
<tr>
<td></td>
<td>Field Ch. 1 through 6</td>
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<tr>
<td></td>
<td>Hair et al. Ch. 1 and 2</td>
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<tr>
<td>1/30</td>
<td>Preliminaries con’t.</td>
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Assignment 1 due

<table>
<thead>
<tr>
<th>2/6</th>
<th>ANOVA/ANCOVA and MANOVA/MANCOVA</th>
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<tbody>
<tr>
<td></td>
<td>Field Ch. 9, 10, 11, and 12</td>
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<tr>
<td></td>
<td>Hair et al. Ch. 6</td>
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<tr>
<th>2/13</th>
<th>ANOVA/ANCOVA and MANOVA/MANCOVA con’t.</th>
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Assignment 2 due

**2/20**  
**Regression Models**

Field Ch. 7 and 8  
Hair et al. Ch. 4 and 5—you don’t have to read Discriminant Analysis

**2/27**  
**Regression Models**


Assignment 3 due

**3/6**  
**Factor Analysis**

Field Ch. 17  
Hair et al. Ch. 3

**3/13**  
**Factor Analysis con’t.**


Assignment 4 due

3/20 Structural Equations Modeling (Intro.)

Hair et al. Ch. 10, 11, and 12
Byrne Ch. 1, 2, and 3.

3/27 SEM con’t. (Mediation and Moderation)


4/3 SEM con’t. (Scale Development and Invariance Testing)

Byrne on Invariance testing.


Assignment 5 due

4/10  **Cluster Analysis, Multidimensional Scaling, and Correspondence Analysis**

Hair et al. Ch. 8 and 9

4/17  **Cluster Analysis, Multidimensional Scaling, and Correspondence Analysis**

Sharma Ch. 7


Assignment 6 due

4/24  **Network Analysis**

Scott Ch. 1 through 8

5/1  **Network Analysis con’t.**

http://faculty.ucr.edu/~hanneman/nettext/ (Read the entire online book and do each analysis)

Assignment 7 due

5/5  **FINAL EXAM**