Structural Equation Modeling

Instructor: Dr. Edward “Ed” Ramirez
Class Time: 8 to 10:50 am; Thursday
Classroom: Blackboard Collaborate Ultra
Phone: 404-732-4891
Email: eramirez29@utep.edu
Office: COBA 214
Office hours: 11:00 am to 12:00 pm; Thursday or by appointment

Course Description

The purpose of this course is to deepen your understanding of research methods, while introducing you to more advanced GLM/covariance-based analytic techniques. Broadly speaking, it focuses on the general linear model, structural equations modeling (SEM), and includes an introduction to Partial Least Squares SEM. We will be using SPSS, SAS, AMOS, and SmartPLS software packages. Since the ultimate goal of a PhD program is to equip you to become productive scholars and autonomous researchers, 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 apply some of the techniques presented on secondary data sets, as well. As such, we will explore how researchers deal with dichotomous outcome variables, latent constructs, and nonparametric bootstrapping procedures to test path coefficients for their significance, for example. Upon completion of the course, you should have a firm foundation on the following areas:

1. Ordinary Least Squares and Logistic Regression Modeling
2. Factor Analysis
3. Cluster Analysis for segmentation using latent variables
4. Structural Equations Modeling (SEM)
5. SmartPLS

Texts

(1) *Structural Equation Modeling with AMOS 3rd edition* by Barbara M. Byrne (Erlbaum and Associates).
(3) *Discovering Statistics Using SPSS* (Introducing Statistical Methods) by Andy Field.
(5) Selected readings.
Seminar Structure

This seminar is fast paced and its workload is heavy. That said, although the course is challenging, it is manageable. 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, which may include conducting in-class software demonstrations. To facilitate discussion, students are expected to have carefully read the 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 to explain it if called upon.

Course Requirements

Grading

These components will determine your grade.

- Class Participation: 33.3%
- Class Assignments: 33.3%
- Final Examination: 33.3%

Academic Honesty

Academic dishonesty is not condoned nor tolerated at UTEP nor 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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| 1/21 | ANOVA/ANCOVA and MANOVA/MANCOVA  
       | Field Ch. 9, 10, 11, and 12  
       | Hair et al. Ch. 6 |
| 1/28 | ANOVA/ANCOVA and MANOVA/MANCOVA con’t.  
       | Assignment 1 due |
| 2/4  | Regression Models  
       | Field Ch. 7 and 8  
       | Hair et al. Ch. 4 and 5—do not read Discriminant Analysis |
| 2/11 | Regression Models  


**Assignment 2 due**

**2/18**  
*Factor Analysis*  
Field Ch. 17  
Hair et al. Ch. 3

**2/25**  
*Factor Analysis con’t.*


**3/4**  
*Structural Equations Modeling (Intro.)*  
Hair et al. Ch. 10, 11, and 12  
Byrne Ch. 1, 2, and 3.

**3/11**  
*Structural Equations Modeling (Intro. con’t)*  
Hair et al. Ch. 10, 11, and 12  
Byrne Ch. 1, 2, and 3.

**3/25**  
*SEM con’t. (Mediation and Moderation)*


3/30  **SEM con’t. (Scale Development and Invariance Testing)**

Byrne on Invariance testing.


Assignment 3 due

4/8  **Cluster Analysis**

Hair et al. Ch. 8 and 9; Sharma Ch. 7

4/13  **Cluster Analysis**


Assignment 4 due

4/20  **Partial Least Squares SEM**

Selected Readings (I will email these.)
4/27 Partial Least Squares SEM

Selected Readings (I will provide you with a flash drive)


Assignment 5 due

5/4 FINAL EXAM (due by 11:59pm)