To help me keep track of email messages, please include EDF 7412 and your name in the subject line of any email message you send to me.

If you have not sent me an email in the past, please send me an email today so I can create a distribution list for the class.

Course Web Page:  http://online.education.ufl.edu/course/view.php?id=4278

Office Hours: Tuesday 5:15-6:15 PM, Thursday 4:15-6:15 PM, and by appointment.  (To set an appointment, send me an email indicating several times when you are free.)  I usually cannot make appointments Tuesday or Thursday before class.

Textbook


Program Manuals


This book contains LISREL examples using the SIMPLIS command language and a reference to the SIMPLIS command language.  A copy has been placed on reserve in the Education library.

Other Readings


**AR** Available on ARES

**ACWS** Available on Course Web Site.

**EL** On Reserve in Education Library

* These papers provide illustrations of methods presented in class. They are provided so students can find more complete presentations of substantive examples than is possible in class.

† Methodological paper or book.

**SEMNET**

SEMNET is a listserv on structural equation modeling. The SEMNET archives (http://bama.ua.edu/archives/semnet.html) can provide useful information about structural equation modeling.
Topics and Readings

A. Confirmatory and exploratory factor analysis

A. Single-factor models
B. Scale indeterminancy
C. Two-factor models, rotational equivalence, and identification
D. S-factor models
E. Exploratory factor analysis

Kline, Chapter 5, pp. 112-118, Chapter 8, 189-210 and 214-222, Chapter 9, pp. 230-244 and 245-248, and Chapter 6, pp. 124-131, 137-144, and pp. 146-149; Joreskog and Sorbom, Chapter 1, pp. 15-27, Chapters 3, 4, 5, and 6; Muthén and Muthén, Example 5.1 and Example 4.1; Skowron and Friedlander; Crocker and Algina; Grapentine; Fabrigar et al.; MacCallum et al.

B. Simultaneous equation models for observed variables

A. Recursive models
B. Goodness of fit tests, goodness of fit indices, and modification indices
C. Nonrecursive models
D. Identification

Kline, Chapter 5, pp. 103-111, Chapter 7, pp. 160-169, and Chapter 6, pp. 132-137 and pp. 146-149; Joreskog and Sorbom, Chapter 1, pp. 1-12, Chapters 3, 4, 5, and 6; Muthén and Muthén, Example 3.11; Bishop and Bieschke.

C. Simultaneous equation models for latent variables (hybrid models)

A. Effect of measurement error
B. Measurement models and structural models
C. Single indicators
D. Identification

Kline, Chapter 5, pp. 118-120, Chapter 10, pp. 265-280 and 289-284 and Chapter 6, pp. 144-149; Joreskog and Sorbom, Chapter 1, pp. 28-43, Chapters 3, 4, 5, and 6; and Examples 5.11-5.13; Burch, M. A., Berko, E. H., & Haase, R. F.; Grapentine

D. Advanced topics

A. Dichotomous and ordinal variables
   Joreskog and Sorbom, 44-50; Muthén and Muthén, Examples 5.2, 5.3, 4.2, 3.12, 3.13 and 3.14
C. Missing Data
   Graham and Hofer; Wothke
D. Alternative methods of estimation and robust analysis
B. Parallel measurements, essentially parallel measurements, and congeneric measurements
Ofir, Reddy, and Bechtel;
E. Multisample analysis of covariance matrices
Kline, Section 7.8; Joreskog and Sorbom, 51-66
F. Multitrait-multimethod analysis
Kline, Section 7.8; Cudek, Marsh
G. Second-order factor analysis
Marsh
H. Longitudinal methods
Olson and Bergman; Willet and Sayer
I. Multisample analysis of covariance matrices and means

Class Attendance

Students are expected to attend class unless they have a valid excuse for missing a class. Examples of valid excuses are illness, attendance at professional conferences, and the like. The advanced topics are not covered by an exam. Nevertheless, students are expected to attend class when those topics are covered. Failure to do so without a valid excuse will result in a decrease in the final grade by one grade category (e.g., an A will become an A-; an A- will become a B+; and so forth).

Requirements

Exams

There will be an exam after Topic 1 and after Topics 2 and 3. The exam will take place on the Tuesday in the week after the topic was completed. As a result you will have between 4 and 7 days to prepare for each exam. A list of study questions will be distributed for each exam.

Data analysis problems

You will receive three data analysis problems, one for each of the first three topics. The problem for the first topic will be due the second class period after the exam for the first topic is taken. The problem for the second topic will be due the second class period after second topic is concluded. The problem for the third topic will be due the second class period after the exam for the second and third topics are taken. Note that the order of the problems you receive is not necessarily the same as the order in which the topics are covered in class.

Paper

There are four options for the paper. If a student in the Program in Research and Evaluation Methodology takes the first option, the study must use models that were not covered in class.

A. Design, conduct, and report a structural equation modeling analysis. With two exceptions the data used in this project cannot come from a conference paper, dissertation, thesis, unpublished, or published study. The exceptions are for data from a study in which (a)
structural equation modeling or regression analysis was not used or (b) structural equation modeling structural equation modeling was used but you propose a **radically different model** than the one used in the document. The report should be in the form of a paper prepared for submission to a journal and should be in APA style for (or in a style used in journals in your field).

I will evaluate the paper by using criteria typically used to judge papers submitted for publication.

1. Is there a good rationale for the research? (Fitting models for no apparent purpose will count against the paper as will failure to fit models that are needed to answer the research questions).

2. Is the data collection clearly and adequately described?

3. Are the models appropriate models in light of the research questions?

4. Are the results presented clearly and in appropriate detail?

5. Are the results interpreted correctly?

6. Are the conclusions clearly justified by the results?

Students who elect option A should append to the paper the programs, and results thereof, used to conduct analyses that are reported in the paper.

Here are two references that may be helpful in writing your paper:


Please note that using structural equation modeling methods is unlike using other statistical methods. There is no guarantee that the model you propose will fit the data. In fact there is no guarantee that the estimation procedure will converge for the model you propose. You may have to make changes to the model and this may take substantial time and effort on your part. **Do not leave the data analysis to the last few days before the paper is due.**

If your model is a hybrid model, then by Thursday, November 3, 2011, you must submit results showing that your measurement model fits adequately.

B. Write a literature review on a methodological issue in structural equation modeling.
The culminating section for a literature review must be either

1. A rationale for and design of a study to answer methodological problem that emerges in the literature review; or

2. A guide to practice with regard to the methodological issue.

The latter would comprise decisions that need to be in an analysis, and criteria for making those decisions. Preparing a guide for practice should be undertaken only if the decisions and criteria are sufficiently complex to make the guide a contribution to the literature on multivariate analysis.

The criteria for evaluating the literature review section will be adequacy of coverage of the literature and the accuracy, clarity, and integration of the review. With regard to the last three criteria, you must give sufficient detail to permit the reader to know what were the purposes, methods and results of each study. Equally important, you must describe consistencies and inconsistencies that emerge across the papers.

A guide to practice will be evaluated by the criteria of importance, clarity, and correctness.

A proposed research study will be evaluated in terms of clarity and quality of the rationale and of the design.

C. Present and illustrate a structural equation modeling method that has not been presented in class. The presentation should, at a minimum, explain the models that are used and the examples should include instruction about how to implement the models in a structural equation modeling program.

Many articles and chapters have been published that present and illustrate SEM methods. If you take option C, it is not sufficient to merely summarize an article or chapter. I expect the presentation to be in your own words.

With three exceptions the data used in this project cannot come from a conference paper, dissertation, thesis, unpublished, or published study. The exceptions are for data from a study in which (a) structural equation modeling or regression analysis was not used, (b) structural equation modeling structural equation modeling was used but you propose a radically different model than the one used in the document, or (c) the software code is not provided in the document and cannot be obtained from the authors or anyone else who subsequently used the data.

Students who elect option C should append to the paper the programs, and results thereof, used to conduct analyses that are reported in the paper.

D. Make a comparison of several (two or more) structural equation modeling methods
that can be used to analyze a given data set. The presentation should, at a minimum, explain the models that are used and the examples should include instruction about how to implement the models in a structural equation modeling program.

The didactic presentation should explain the models that are used and the example should include instruction as to how to implement the methods in appropriate software.

There are published articles and chapters that present and compare SEM methods. If you take option D, it is not sufficient to merely summarize an article or chapter. I expect the didactic presentation to be in your own words.

With three exceptions the data used in this project cannot come from a conference paper, dissertation, thesis, unpublished, or published study. The exceptions are for data from a study in which (a) structural equation modeling or regression analysis was not used, (b) structural equation modeling structural equation modeling was used but you propose a radically different model than the one used in the document, or (c) the software code is not provided in the document and cannot be obtained from the authors or anyone else who subsequently used the data.

Students who elect option D should append to the paper the programs, and results thereof, used to conduct analyses that are reported in the paper.

The paper is due on Friday, December 9, 2011 by 5:00 PM.

Paper Proposal

You must submit a brief proposal for your paper by Thursday, October 6, 2011.

Because the proposal is due before I complete coverage of the first three topics, doing the following develop may help you understand the applications of SEM that are covered in the first three topics:

1. Read Chapter 5 in Kline.
2. Read the papers on which your exercises are based.

It may be helpful for you to talk with me about your paper before you submit the proposal. Proposals for a structural equation modeling analysis (Option A) must include (a) the sample size, (b) for each instrument used in data collection, report the number of items and the number of scale points on the items (c), for other methods of data collection (e.g., a brain scan), briefly describe the nature of the data produced by the method, (d) a path diagram for the model or models to be estimated in the study, and (e) a rationale for the model. If you propose using data from a conference paper, dissertation, thesis, unpublished, or published study, submit a copy of the relevant document with your proposal.

I will respond to your proposal by (a) approving it, (b) asking for clarification, or (c) asking for a new proposal. In the event of (b) I will expect your response by the class period
following the date on which I return the proposal. In the event of (c) I will expect your response by the fourth class period following the data on which I return the proposal. Getting a proposal approved sometimes takes several cycles.

Late proposals will be accepted as will revisions that do not meet the time lines presented above. However, late proposals and resubmissions may delay your work on the project and as a result have a negative impact on the grade awarded to your paper.

**Late Data Analysis Problems and Papers**

Papers submitted after Friday, December 9, 2011 will be graded last and may result in an I grade for the course.

Late data analysis problems and papers will receive grade penalty according to the following table:

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<th>Number of Days Late (or part thereof)</th>
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**Submission of Work**

Data analysis problems, the paper proposal, and papers must be submitted electronically at [http://online.education.ufl.edu/course/view.php?id=4278](http://online.education.ufl.edu/course/view.php?id=4278). A data analysis problem must be received by 3:00 on the due date or it will be considered late.
Grading

All work will be scored by using the following 23-point scale:

<table>
<thead>
<tr>
<th>Score</th>
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<tr>
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<td>19-20</td>
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<td>17-18</td>
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<td>15-16</td>
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<td>13-14</td>
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<td>11-12</td>
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An overall exam score will be obtained by averaging the individual exam scores. An overall data analysis score obtained by averaging the individual data analysis exercise score. A total score will be obtained by averaging the overall exam score, the data analysis score, and the score on your paper.

Academic Honesty

Students are expected to do their own work on exercises that are submitted for a grade. You should not solicit help with your data analysis problems from other people (including students and faculty), nor should you provide help to other students. Soliciting help includes discussing with other people (including students and faculty) what the appropriate approach to an exercise might be.

If you need to discuss a data analysis problem you should talk with me. Be advised however that if your question is about the correct analysis for an exercise I will usually require you to phrase your question about analysis in general and not about the specific data analysis problem. If you know the correct analysis and have a question about a computer program or formula to implement the analysis, I will usually answer the question directly.

You are expected not to cheat on examinations.

In the event a violation of standards of academic honesty occurs, I will contact the Office of Student Conduct and Conflict Resolution to determine if it is the first violation. If not, I will turn the matter over to the Student Conduct and Conflict Resolution office. For a first offense the exercise or the exam will receive a grade of zero.
Students with Disabilities

Students with disabilities who need reasonable modifications to complete assignments successfully and otherwise satisfy course criteria are encouraged to meet with the instructor as early in the course as possible to identify and plan specific accommodations. Students must supply a letter from the UF Office for Students with Disabilities to assist in planning modifications.