Course Syllabus
Psychology 9555A. Structural Equation Modeling (Fall 2013)

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Course Description
This course serves as an introduction to structural equation modeling (SEM), a very flexible technique for modeling relationships among variables. The course assumes no prior experience with SEM, and it is intended as both a theoretical and practical introduction. However, students will benefit from previous knowledge of multiple linear regression, factor analysis, and psychometric principles of reliability and construct validity. Software packages demonstrated in the course will include Mplus and AMOS. Course topics will include confirmatory factor analysis (CFA), traditional path analysis, and basic principles of model building including specification, identification, estimation, hypothesis testing, and modification. The overall objective of this course is to provide students with the necessary knowledge to apply SEM to research in scale construction and evaluation, construct validation, theoretical development and special designs involving mediation and moderation, multi-group analyses, and latent growth modeling. Prerequisite: must have taken Psychology 9540 (Research Design) or 9041 (Introduction to Statistics using R) or obtained the permission of the instructor. Wednesdays, 9:00 am to 12:00 noon, Room SSC 8438-8440. Start date: Wednesday, September 11, 2013.

	Date	Topic	Readings
1	Sep 11	Introduction and overview	Ch. 1,
2	Sep 18	Building blocks: MR and FA	Ch. 2, 3
3	Sep 25	Steps in SEM	Ch. 5
4	Oct 2	Introduction to CFA	Ch. 6, 7, 8, 9
5	Oct 9	CFA – Measurement & Test Construction	Ch. 6, 7, 8, 9
6	Oct 16	CFA Extensions (Invariance, Means)	Ch. 9, 11 (299-304)
7	Oct 23	Introduction to the Full SEM model	Ch. 10
8	Oct 30	SEM models continued (mediation)	Ch. 10
9	Nov 6	SEM Extensions (interactions)	Ch. 12 (327-342) skip Kenny-Judd
10	Nov 13	Latent Growth Modeling	Ch. 11 (LGM section)
11	Nov 20	MLM and SEM	Ch. 12 (343-355)
12	Nov 27	Monte Carlo Analysis – Power	(see Mplus manual Ch. 12)
13	Dec 4	Projects	

The course textbook is Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling. Third Edition*. New York: Guilford Press.

Additional Resources:
www.statmodel.com
free demo version of Mplus
free *Version 7 Mplus User's Guide* in pdf

Evaluation

50%: Short tests. Each week, beginning during the third class (Sep 25), there will be either a short test (15 min max) test just before the mid-break or a mini-lab assignment (approximately 5 tests and 5 labs). The tests will consist of a question from core material mainly from the previous week lecture and readings and will focus on understanding and application of the procedures (e.g. "Draw a multiple regression model with three predictors using SEM symbols indicating all paths, correlations, and residuals"). The mini-lab assignments will consist of running analyses and interpreting output. **Your total grade for the short-test/lab component will be calculated as the average of the best 9 of 10 tests/labs**. There will be no make-up tests; thus if you miss a class, your grade for this component will be based on the 9 tests/labs that you will have taken. Students who miss more than one class will need to write an additional test at the end of the course to compensate for their incomplete evaluation.

50%: Individual project. You will be required to conduct analyses for an individual project. This project will be divided into two parts: (1) an evaluation of the measurement model (similar to a confirmatory factor analysis) and an evaluation of the complete model including measurement and structural components. For the complete SEM model you will be required to include one of the following: (1) a mediation analysis (2) a moderation (interaction) analysis, (3) a multi-group analysis, or (4) a longitudinal analysis. You will need to use a real (or simulated) data set, develop hypotheses/research questions, conduct the SEM and related analyses, interpret the results and write a report of the results and your interpretations and conclusions. You will have the choice between:

1. using a large data set that I can provide
2. providing one yourself (approved by the instructor)
3. creating a simulation data set as part of a research proposal (I will explain this option).

Note that you will need to have your topic no later than Oct 2. You will need to provide a brief report of the first part (the measurement/confirmatory analysis component) by November 6th (worth 20%) and the complete research report (written as an APA research article but with greater emphasis on the Results and Discussion sections) with syntax and output in an Appendix by Dec 11 (worth 30%).

Sample articles for SEM project write-up.

Morton, N. A., & Koufteros, X. (2008). Intention to commit online music piracy and its antecedents: An empirical investigation. *Structural Equation Modeling*, *15*, 491-512.

Tremblay, P. F., Mihic, L., Graham, K., & Jelley, J. (2007). The role of motivation to respond to provocation, the social environment, and trait aggression in alcohol-related aggression. *Aggressive Behavior*, *33*, 389-411.