SC 705: Advanced Statistics
Spring 2010

Monday 9:30 am-12:00 pm
531 McGuinn Hall

Professor: Sara Moorman
Office: 404 McGuinn Hall
Office hours: Mondays 1:00-3:00 pm or by appointment
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Phone: 617-552-4209

About the Course
This applied course is designed for students in sociology, education, nursing, organizational studies, political science, psychology, or social work with a prior background in statistics at the level of SC 703: Multivariate Statistics. It assumes a strong grounding in multivariate regression analysis. The major topics of the course will include hierarchical linear modeling and structural equation modeling. We will use HLM and LISREL to conduct the analyses.

Required Readings
Texts to purchase:


Course reserves online:
Access readings preceded by an asterisk (*) as .pdf files through the library website (http://www.bc.edu/libraries/) or through the link on the course Blackboard page (https://cms.bc.edu/webct/entryPageIns.dowebct).
**Required Software**

This course requires the use of the programs LISREL and HLM. Both are available on the computers in the Sociology graduate student lounge. For use on your own Windows computer, student versions are freely downloadable from Scientific Software International:

**Assessment**

**Grading scale**

<table>
<thead>
<tr>
<th>Task</th>
<th>Due date</th>
<th>Percentage of grade</th>
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<tbody>
<tr>
<td>10 homeworks</td>
<td>February 1-May 15</td>
<td>50 (5 each)</td>
</tr>
<tr>
<td>SEM mini-project</td>
<td>March 15</td>
<td>25</td>
</tr>
<tr>
<td>HLM mini-project</td>
<td>May 15</td>
<td>25</td>
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*Weekly homework:* At the end of class each week I will provide ~3 problems based on the lecture and readings for the day. The problems will be due, in hard copy or e-mailed to me in .pdf format, no later than the beginning of the next class session. I will not grade late work.

*Mini-projects:* The two major topics in this course, SEM and HLM, are usually distinct in application. Therefore, at the end of each half of the course, you will complete a mini-project. These assignments will include ~6 related problems that will draw upon material from all weeks we spent on SEM or HLM.

**Academic Honesty**

Your work must be your words and ideas. When writing papers, use quotation marks around someone else’s exact words and identify whose words they are. If you come across a good idea, by all means use it in your writing, but be sure to acknowledge whose idea it is. Do not allow another student to copy your work. Failure to comply will result in (a) automatic failure of the assignment, and (b) a report to the Dean and the Committee on Academic Integrity. For further information, please review the College’s policies on academic integrity here: http://www.bc.edu/offices/stserv/academic/resources/policy.html#integrity
Schedule

January 25: Introduction to Structural Equation Modeling


February 1: Estimating Structural Equation Models in LISREL


February 8: Factor Analysis and Multi-group Models


February 15: Fit Statistics, Model Modification, and Alternative Models


February 22: Troubleshooting


*** March 1: Spring vacation, no class***
March 8: Criticisms of Structural Equation Modeling, or Troubleshooting Journal Reviewers


March 15: Introduction to Hierarchical Linear Modeling

March 22: Between- and Within-Group Variance


March 29: Centering; Random Intercept Models


*** April 5: Easter Monday, no class***

April 12: Random Slope and Intercept Models


*** April 19: Patriots’ Day, no class***

April 26: Modeling Categorical Outcomes


May 3: Longitudinal Analysis


May 10: Three Level Models

