**Course Syllabus**  
*Psy 510/610: Multilevel Regression*  
*Spring 2017*

**Instructor**  
Jason T. Newsom, Ph.D., Professor, Department of Psychology. Office: 317F Cramer Hall Center (3rd floor), Email: newsomj@pdx.edu. Office hours: Tu 1:00–2:00 PM, Wed 1:00–3:00 PM, and by appointment.

**Meeting Times and Location**  

**Text**  

**Recommended Text**  

**Optional** (not at the PSU bookstore)  


**Overview**  
This course is intended to introduce students to multilevel regression techniques (also known as hierarchical linear models or random coefficient models) and will cover the fundamental concepts and application of the techniques. By the end of the course, students should be able to apply, write about, critique applications of, and read methodological articles about multilevel regression analysis.

**Prerequisites**  
This course assumes that students have taken a graduate statistics course that covers simple and multiple regression.

**Readings and Commentaries (5%)**  
There will be several readings assigned each week taken from the text and supplemental sources. The readings will usually include an example article that applies SEM Please read the material prior to class and be prepared for discussion. Students will be required to turn in a one-page commentary on the readings for that week on each Tuesday by 2 PM via email. The commentaries should be an informal set of questions, comments, or summary information (summarize only if you cannot think of anything else to say) about the articles. The purpose of the commentaries is to make sure the class is prepared for discussion and to help the instructor identify discussion topics and sources of confusion in the readings. I will assign 2 (complete and well-considered), 1 (did not read some/lacking effort), or 0 (did not read most/minimal effort/late/nothing) points to each, with one freebie.

**Homeworks**  
There will be three homework assignments consisting of data analysis and reporting of multilevel regression problems using R, SPSS or the student version of the multilevel package, HLM 7 (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011; Scientific Software International). The student version of HLM can be downloaded from the following internet site: [http://www.ssicentral.com/hlm/student.html](http://www.ssicentral.com/hlm/student.html). It is unlikely that you will need to refer to the manual, but much of the information is available under the help function of the package.
Homework due dates are: Wed 5/3, Wed 5/23, Wed 6/14. Late assignments are not accepted without penalty (10% per day late) except for cases of illness or family emergencies. Please contact me ahead of time if you are going to miss the deadline for any reason.

Grades
Grades are based on an average of the three homework assignments with total percentages assigned the following grades:  $\geq 90 = A$, 85-89.9 = B+, 80-84.9 = B, 75-79.9 = C+, 70-74.9 = C.

Other Resources
There are several useful electronic links on the class website. Of particular note is a website devoted to multilevel analysis with links to software and other useful information is at http://www.cmm.bristol.ac.uk/links/index.shtml. I also suggest that you subscribe to the multilevel listserv at: http://www.bristol.ac.uk/cmm/learning/support/jisc.html (a digest format is available). A great deal can be learned from seeing questions and answers from other researchers wrestling with multilevel analysis issues.

Disabilities
I am happy to make any necessary arrangements with students who have a disability and are in need of academic accommodations. If you have not done so already, please contact the Disability Resource Center, 116 Smith Memorial Student Union, http://www.pdx.edu/drc/, Email: drc@pdx.edu, for assistance and any testing arrangements. I would appreciate it if you would check with me as soon as possible to discuss any needed accommodations and to make sure that I have received a faculty notification letter. If any aspects of instruction or course design result in barriers to your inclusion or learning, please let me know.
Course Readings
Psy 510/610 Multilevel Regression, Winter 2017

All supplemental readings available online at the class website: http://web.pdx.edu/~newsomj (password protected zip file—check with me for the password)


4/12 Regression Review & Overview of Multilevel Regression
• S & B, Chapter 1 & Chapter 2.
  • Kreft & de Leeuw, pp. 1-8
  


4/19 Random vs. Fixed Coefficients, Random Intercept Models, Intraclass Correlation Coefficient
• Kreft & de Leeuw, pp. 10-12.
  • S & B, Chapter 4, Sections 4.1 - 4.5 and Section 4.9 only. (Optional: Chapter 3).
  


4/26 Full Multilevel Regression Models, Part I: Varying Slopes, Hypothesis Tests, Explained Variance, Model Building
• S & B, Chapter 5, except Sections 5.2 and 5.3.1, Chapter 6.


5/3 Homework 1 Due

5/3 Full Multilevel Regression Models, Part II: Cross-level Interactions & Centering
• S & B, Chapter 5, Section 5.2 only (cross-level interactions)


• S & B, Chapter 4, Section 4.6 only, Chapter 5, Section 5.3.1 only (centering)


5/10 **Estimation Methods, Assumptions & Diagnostics**
- S & B, Chapter 4, Sections 4.7 – 4.8 only (estimation).
- S & B, Chapter 10 (assumptions & diagnostics).
- Raudenbush & Bryk, pp. 266-280 (assumptions, diagnostics, remedies)
- S & B, Chapter 12, Sections 12.1 – 12.2 only (remedies).

5/17 **Growth Curve Models, Part I: Linear Growth**
- Singer & Willett, Chapter 2 & 3.
- Hox, Chapter 5, pp. 79-99


5/23 **Homework 2 Due**

5/23 **Growth Curve Models, Part II: Extensions of Growth Curve Models**
- S&B Chapter 15
- Singer & Willett, Chapter 6.


5/31 **Binary and Noncontinuous Outcomes**
- S&B Chapter 17
- Hox, Chapters 6 & 7.


6/7 **Missing Data, Sample Size Issues & Power**
- S&B, Chapter 9 (missing data)
- Hox, Chapter 12 (sample size & power)
- S&B Chapter 11 (sample size & power)


6/14 (No class—finals week) **Homework 3 Due 4 PM**