RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY
SCHOOL OF SOCIAL WORK
COURSE OUTLINE
16:910:638 Advanced Statistical Methods Fall 2015

Instructor: Andrew Peterson
Office: Room 303, Annex
Telephone: 848-932-7520
Email: andrew.peterson@ssw.rutgers.edu
Credit Hours: 3
Classroom Hours: Monday, 3:00-5:40 pm
Office hours: By appointment

Course Overview and Objectives
This is a course in advanced statistical methods. The objective of the course is to achieve an understanding of the advantages and limitations of various statistical techniques. The focus of this course is principally upon the development of both conceptual and computer tools needed for advanced statistics in hypothesis testing, model fitting and estimation, and interpretation of data. Students are expected to use actual data to gain experience on data analysis and data interpretation through computer exercises. The objectives of this course are: (1) to provide students with knowledge on multivariate statistical analyses, (2) to develop students’ skills in modeling and carrying out their own research, and (3) to improve students’ abilities to critically analyze published work in the social sciences.

Required Materials
IBM SPSS Statistics Standard GradPack (including AMOS for structural equation modeling). Available at www.software.rutgers.edu/.

Course Requirements and Grading
1) It is important that assigned readings be completed on a timely, weekly, basis in order to have informed class discussions. All class lectures will assume that students have read the assigned material.
2) Class participation and attendance (15% of final grade) are considered in evaluating grades. Students are expected to notify the class instructor if they are unable to attend class for any reason. Unexcused absences will affect your grade negatively.
3) Three assignments (45% of final grade) will be provided. These are intended to provide you an opportunity to practice, and to test, the analytic skills you have learned from the readings and hands-on experiences. A dataset will be provided. Each assignment is worth 15% of your grade.
4) A final project (40%). Students are expecting to address research questions or hypotheses using statistical analyses that are covered over the semester. Students will present their projects in class. A detailed description will be provided in advance of the due date.
Course Outline

I.  **Weeks 1 (Sept. 7) & 2 (Sept. 14)**  
Introduction to Data Analysis, SPSS and AMOS  
   - Linking research questions to measurement, design and analysis  
   - Flat files  
   - Variables, variable labels, and value labels  
   - Frequency distributions/histograms/scatterplots  

Data management and cleaning  
   - Sorting  
   - Merging  
   - Recoding items  
   - Computing scales/composite variables  

Reliability and descriptive statistics  
   - Coefficient alpha  
   - Levels of measurement  
   - Measures of central tendency  
   - Measures of dispersion  

Readings for Weeks 1 & 2:  
   Field (2013) (Chps 1 - 5)  

II.  **Weeks 3 (Sept. 21), 4 (Sept. 28), 5 (Oct. 5) & 6 (Oct. 12)**  
Group differences  
   - T-tests; indep. samples/ pairs  
   - Analysis of variance/covariance  
   - One-way, two-way, three-way ANOVAs/ interactions  
   - Repeated measures  
   - Multivariate analysis of variance/covariance  
   - Discriminant analysis  

Readings for Week 3-4:  
   Field (2013) (Chps 9, 11, & 12)
Readings for Weeks 5 & 6:
Field (2013) (Chps 13, 14 & 16)

III. Weeks 7 (Oct. 19), 8 (Oct. 26)

*** NOTE: ASSIGNMENT I DUE OCT. 19 ***

Relationships between variables
Correlation
Regression
Types of regression
Testing mediation and moderation with regression
Canonical correlation

Readings for Weeks 7 & 8:
Field (2013) (Chps 7, 8, & 10)

IV. Weeks 9 through 14

Factor analysis and structural equation modeling
Exploratory factor analysis
Confirmatory factor analysis
Path analysis with observed variables
Testing full structural equation models
Testing cross-lagged relationships

Week 9 (Nov. 2)

*** NOTE: ASSIGNMENT II DUE NOV 3 ***

Exploratory Factor Analysis and Confirmatory factor Analysis
Readings for Week 9:
Field (2013) (Chp 17)

**Week 10 (Nov. 9)**

Applying Confirmatory Factor Analysis to Test Alternative Models/Method Bias

Readings for Week 10:
- Byrne (2010) (Chps 1-3)

**Week 11 (Nov. 16)**

Path analysis with observed variables (replicating a model using an input matrix; understanding direct and indirect effects)

Readings for Week 11:

**Week 12 (Nov. 23)**

*** Class will not meet the week of Nov. 23 ***

**Week 13 (Nov. 30)**

*** NOTE: ASSIGNMENT III DUE NOV. 30 ***

Testing Full Structural Equation Models
- Byrne (2010) (Chp 9)

**Week 14 (Dec 7)**

**Testing Cross-Lagged Relationships**


**Week 15 (Dec. 14) – Final Project Presentations**

**Course Evaluation:** Rutgers University issues a survey that evaluates both the course and instructor. This survey is completed by students toward the end of the semester, and all answers are confidential and anonymous. The instructor may also choose to conduct a mid-point evaluation.

**Academic Integrity Policy:** All work submitted in a graduate course must be your own. It is unethical and a violation of the University’s Academic Integrity Policy to present the ideas or words of another without clearly and fully identifying the source. Inadequate citations will be construed as an attempt to misrepresent the cited material as your own. Use the citation style preferred by the discipline. Plagiarism is the representation of the words or ideas of another as one’s own in any academic exercise. To avoid plagiarism, every direct quotation must be identified by quotation marks or by appropriate indentation and must be properly cited in the text or in a footnote. Acknowledgement is required when material from another source is stored in print, electronic, or other medium and is paraphrased or summarized in whole or in part in one's own words. To acknowledge a paraphrase properly, one might state: “to paraphrase Plato’s comment…” and conclude with a footnote identifying the exact reference. A footnote acknowledging only a directly quoted statement does not suffice to notify the reader of any preceding or succeeding paraphrased material. Information which is common knowledge, such as names of leaders of prominent nations, basic scientific laws, etc., need not be footnoted; however, all facts or information obtained in reading or research that are not common knowledge among students in the course must be acknowledged. In addition to materials specifically cited in the text, only materials that contribute to one’s general understanding of the subject may be acknowledged in the bibliography. Plagiarism can, in some cases, be a subtle issue. Any question about what constitutes plagiarism should be discussed with the faculty member. Plagiarism along with any and all other violations of
academic integrity by graduate and professional students will normally be penalized more severely than violations by first-year undergraduate students. Since all violations of academic integrity by a graduate or professional student are potentially separable under the Academic Integrity Policy, faculty members should not adjudicate alleged academic integrity violations by graduate and professional students, but should refer such allegations to the appropriate Academic Integrity Facilitator (AIF) or to the Office of Student Conduct. The AIF that you should contact is Antoinette Y. Farmer, 732.932.2621. The student shall be notified in writing, by email or hand delivery, of the alleged violation and of the fact that the matter has been referred to the AIF for adjudication. This notification shall be done within 10 days of identifying the alleged violation. Once the student has been notified of the allegation, the student may not drop the course or withdraw from the school until the adjudication process is complete. A TZ or incomplete grade shall be assigned until the case is resolved. For more information regarding the Rutgers Academic Integrity Policies and Procedures, see: http://academicintegrity.rutgers.edu/integrity.shtml.

Disability Accommodation: Please Note: Any student who believes that s/he may need an accommodation in this class due to a disability should contact the University Office of Disability Services, Lucy Stone Hall, Livingston Campus 54 Joyce Kilmer Avenue, Suite A145, Piscataway, NJ 08854-8045, email address: dsoffice@rci.rutgers.edu, Phone: (848) 445-6800, fax: (732) 445-3388, for a letter of accommodation. (Undergraduate New Brunswick students should contact the Coordinator for Students with Disabilities for their College.) Students who are taken courses in Camden should contact Mr. Tim S. Pure, Assistant Director/Disability Services Coordinator, Rutgers-Camden Learning Center, Armitage, Hall, Room 231, 311 N. 5th Street, Camden, NJ 08102, email address: tpure@camden.rutgers.edu. Students who are taken courses in Newark should contact Ms. Genevieve Sumski, Disability Services Coordinator, Robeson Campus Center-Newark, 350 ML King, Jr. Boulevard, Newark, NJ 07102-1898.. Any student, who has already received a letter of accommodation, should contact the instructor privately to discuss implementation of his/her accommodations immediately. Failure to discuss implementation of accommodations with the instructor promptly may result in denial of your accommodations.