**1. ERMA 8340 Structural Equation Modeling (**3 credit hours)

**2. Semester Spring 2014**

Instructor: Joni M. Lakin

4032 Haley Center

(334) 844-4930

joni.lakin@auburn.edu

Office Hours: Monday 3-4pm, Wednesday 3-4pm, and by appointment.

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**3. Resources**

**Required**: Byrne, B. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. Routledge Tyler & Francis Group, LLC, NY. ISBN-10: 0805863737.

**Recommended:** Kline, R.B. (2010). *Principles and Practice of Structural Equation Modeling* (3rd ed.). Guilford Press. ISBN-10: 1606238760.

Mertler, C., & Vannatta, R. (2013). *Advanced and Multivariate Statistical Methods: Practical Application and Interpretation*. Pyrczak Publishers.

*\* A copy of the Byrne and Kline texts will be on hold at the MAIN library.* *Other resources on Canvas, when possible.*

*\* All written assignments must be completed in APA (6th ed.) style. Please obtain the style manual if you are not familiar with this format.*

**4. Course Description:**

This course is designed to provide students the understanding of factor analytic and structural equation modeling (SEM) statistical procedures. Regression and path analysis, prerequisites for understanding more complex models, are reviewed. This course emphasizes the conceptual and practical application of factor analysis and SEM. A hands-on approach to analyzing data using AMOS and interpreting output is used.

**5. Course Objectives**

Students will:

• Gain an understanding of factor analytic procedures.

• Apply knowledge of factor analysis by analyzing data to assess factor analytic models.

• Apply knowledge of factor analysis through interpreting output and revising models as indicated by results

• Interpret the results of the analyses in terms of the research hypothesis and/or purposes

**Note: We will be using the Canvas learning management system for this course. Check the Canvas site frequently for announcements and handouts for class.**

**6. TENTATIVE Course Content and Schedule Readings and Assignments Due**

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| Week 1 (1/8) | **Introduction and Syllabus**  Large Scale Data Sets  Review of Dummy Coding | *Upload Path Diagrams* |
| Week 2 (1/15) | **Introduction continued, specifying variables and model** | Byrne Ch. 1-2  Kline Ch. 2-4  Optional: Mertler & Vannatta Ch 7 (if you need to review regression methods in more detail than Kline provides)  *Upload Data Set and Weighting Information* |
| Week 3 (1/22) | **Path Analysis**  Path Coefficients | Mertler & Vannatta Ch 8  Rick et al. 2011  Optional: Kline Ch. 5  *Upload Path Analysis Assignment* |
| Week 4  (1/29) | **Exploratory Factor Analysis** | Mertler & Vannatta Ch 9 (scan)  Pascarella & Terenzini (1983)    *Upload Annotated Exploratory FA Output and Model (Annotation to be interpretation of major output components)* |
| Week 5 (2/5) | **Introduction to Structural Equation Modeling and AMOS**  *Student presentation—Other Software Packages Available* | Byrne Ch.10  Schreiber et al. (2006)  Meyer article  *Upload Model Specification Assignment* |
| Week 6 (2/12) | **Identification**  Confirmatory FA (large scale data set)  *Consult on Final Project Topic (for A)* | Byrne Ch. 3  *Upload Confirmatory FA Model and Annotated Output (Annotation to be interpretation of major output components)* |
| Week 7 (2/19) | **Errors and Problems**  *Student presentation—Missing Data Imputation* | Byrne Ch. 12 and 13  Kline Ch. 12  Asmundson et al (2000)  ***Before class:*** *Send/Upload an article containing a CFA, create list of statistics reported in results section and author’s interpretation*  *Upload Assessment of Data Problems* |
| Week 8 (2/26) | **The Measurement Model** | Byrne Ch. 4 and 5  *Upload Measurement Model and Annotated Output (Annotation to be interpretation of major output components)* |
| Week 9 (3/5) | **The Full Structural Model**  Full Structural Model (large scale data set) | Byrne Ch. 6  *Upload Structural Model and Annotated Output (Annotation to be interpretation of major output components)*  ***Final topic and data chosen for final project (for A)*** |
| 3/12 | Spring break |  |
| Week 10 (3/19) | **Multiple Group Equivalence**  Multiple Group Equivalence (large scale data set) | Readings: Byrne Ch. 7  Day et al. 1998  *Upload Multiple Group Model and Annotated Output (Annotation to be interpretation of major output components)* |
| Week 11 (3/26) | **Catch up and Additional issues**  Problems related to Post Hoc Model Fitting  *Student Presentation--Multi-Trait Multi-Method Introduction* | Readings: Byrne Ch. 8-10  Lakin (2012)  Other readings as assigned  *Upload Activity* |
| Week 12 (4/2) | **Catch up and Additional issues**  *Student presentation—*Using item parcels in SEM  *AERA 4/3-4/7* | Little 2013  Marsh et al. 2013  Other readings as assigned |
| Week 13  (4/9) | **Projects consultation (for A)** |  |
| Week 14  (4/16) | **Latent Growth Modeling**  *Student Presentation*—*Cross-validation* | Byrne Ch.11  Other readings as assigned  *Upload Activity* |
| Week 15  4/23 | **Roundtable and PowerPoint Presentations (for A – all welcome)**  **Written components due** | *Bonus points for attending if not submitting project* |
| Finals | No final exam |  |

**7. Course Requirements and Evaluation**

*Learning Methods:* Discussions, lectures, readings, lab exercises, and projects. Primary emphasis will be on lab exercises and a final project, supported by textbook readings and other assignments. The purpose of these activities is to build a practical foundation for conducting research using FA and SEM methods.

*Student Assessment*

In-class Assignments

Completion 40%

Accuracy of interpretations 40%

Student Presentation (in group) 10%

Authentic Projects 5% To be completed for an A

Roundtable Presentation 5% To be completed for an A (all welcome)

*Grading scale*

A – Completion of in-class assignments and projects with at least 90% accuracy and completion of Authentic Project with at least 80% accuracy

B – Completion of in-class assignments and projects with at least 80% accuracy

C – Completion of in-class assignments and projects with at least 70% accuracy

D - Completion of in-class assignments and projects with at least 60% accuracy

F – Failure to meet minimum requirements for a D

\*\*\*\*\*You CANNOT make up more than 2 in-class assignments. Thus, if you miss more than two assignments, your percent grade will be affected. \*\*\*\*\*

**8. Class Policy Statements**

*Attendance Policy*

* Attendance is expected, but not required. If you miss class, you will need to get notes from another student.
* I will start class on time, so if you are late you will need to get notes from another student.

*Late Assignments Policy*

* Assignments turned in late will receive a 5% reduction in earned points per day. The only exception will be in the case of emergency.
* Except for in-class work, all work must be typed or it will **not** be graded. Late penalty will be applied to work completed in writing and then turned in late in typed format for a grade.

*Incompletes and Withdrawals*

Grades associated with incomplete course work or withdrawal from class will be assigned in strict conformity to University policy (see Auburn University Bulletin). If you wish to drop this course you may do so by the 10th class day with no grade assignment. From the 10th class day to mid-semester a W (withdrawn-passing) grade will be recorded in your transcripts. After this period withdrawal from the course will only be granted under unusual circumstances and must be approved by the Dean of the College of Education.

Note that the incomplete grade (IN) policy is in effect. The new policy requires that students complete a form requesting that an IN grade be assigned. If this form in not completed and given to the instructor of the class, a grade will be assigned with a score of zero (0) for work that has not been completed and turned in by the time the instructor reports grades.

*Academic Misconduct*

The Department of EFLT recognizes university policy regarding academic misconduct. Violations include, but are not limited to: plagiarism, unauthorized assistance during examinations, submitting another’s work product as your own, using another’s words as your own without appropriate citation, sharing unauthorized materials with another that contain questions or answers to examinations, altering or attempting to alter assigned grades. In accordance with University policy regarding academic misconduct, students may be subject to several sanctions upon violations of the Student Academic Honesty Code. See the Tiger Cub publication for the current year for specifics regarding academic misconduct as well as student’s rights and responsibilities associated with the Code.

*Disability Accommodations*

Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1228 Haley Center, 844-2096 (V/TT).