While for most students, some of the material will be review, the course will be taught at the graduate student level. That is, students are expected to have a level of commitment to the course well beyond that expected for undergraduates in their courses, as the material covered in this course may be of use throughout the students' careers. It is expected that multiple readings of material will have been undertaken before class, and that an all-out effort will be made to understand the material and to work on assignments for the class.

The instructor will do his best to make sure that the information presented is understandable, but expects that students will have first spent some time trying to assimilate the material on their own. Quizzes in this class will be completed in-class, will be designed to be difficult, and will be graded on a curve, so that students who have superior ability and/or have expended much effort will be able to demonstrate these on the exam. Late assignments will not be accepted and make-up exams will not be given, except for extenuating circumstances.

Each student must keep up with the material as we go along; statistical methods is typically not a subject for which several weeks of material can be crammed into one's brain in several hours. Laboratories to become familiar with computer programming, model testing, and completing exercises will be required. Students are strongly urged to stop in during office hours with Dr. Zimmerman or Ms. Dekhtyar if they have any questions.

Primary Course Objectives

- to familiarize graduate students in the social and behavioral sciences with the language, logic, and implementation of structural equation modeling;
- to compare and contrast structural equation modeling with more commonly used statistical strategies in the social and behavioral sciences such as multiple regression analysis and factor analysis;
- to teach the criteria associated with the decisions that must be made at each phase of a structural equation modeling analysis;
- to consider the philosophical and statistical criticisms of structural equation modeling as an approach to research design and data analysis;
- to provide firsthand experience reviewing research reports that feature structural equation modeling and writing up and presenting orally the results of structural equation modeling analyses.
Elements of the Course

Readings
There are three required books:

Most weeks, additional readings are also required. More advanced topics are occasionally covered in suggested (but not required) readings, marked by an asterisk (*). All additional readings (generally as pdf files) will be posted on the course website by the first day of class.

Quizzes
Two quizzes will comprise the testing in the course. While we hope you will read and learn the material just for learning sake, sometimes in the mix of other activities and coursework, it is easy to let readings and mastery of the material go by the wayside. So, I think some grades related to mastery of the material may help students keep on the top of the material, and have decided to include 2 quizzes as part of your grade. Each will occupy about 30 minutes of class time on Feb. 26 and Apr. 2. Most will be short answer or short essay but some writing of computer programming, simple calculations, path diagrams, and /or interpreting output may also be included.

Homework Assignments
Three homework assignments will also be required. All will use the dataset we are using for the course, a 3-wave, longitudinal sample of about 5000 rural high school students from the beginning of 9th to the end of 10th grade. We will discuss the dataset and the codebook for the dataset in the first laboratory section of the course, to be held the week of Jan. 29. Laboratory sessions will focus on preparing students for these homework assignments, including practice questions.

Research Project
The major product of the course will be a written report of a structural equation modeling analysis you conduct on data of your choosing. On Feb. 19 I will ask you to specify a dataset that you will analyze and write up for the course. On Mar. 26 I will ask you to prepare a document in which you specify the names and characteristics of the variables your analysis will include and the nature of the model you plan to fit. All models should include both measurement and structural components for this assignment. About two-thirds of the way through the course I will ask you to meet outside of class with another member of the class to discuss your data and plan of analysis and to exchange feedback on your projects. The final draft of the research project is due by May 3rd at 10 a.m. An 8-10-minute oral presentation will also be given on either April 23 or April 30.

Attendance and Participation
Students are expected to attend all class sessions, as both hearing about statistics material and reading it as important elements to learning it. Attendance is also required at laboratory sessions (1 per week), as *doing* statistics is probably the most important learning component of all. I also expect students’ participation in class; both the quality and quantity of student’s participation will be considered in their evaluation.
**Published Article Presentation**

Each student will give a 2-minute presentation in which he/she describes and evaluates a published study in which the data are analyzed using structural equation modeling. Students can choose from a list of recently published articles in top-tier journals in their field of study; references and abstracts for psychology, communication, and business/economics/marketing will be available on the course website by January 31, over two months before the presentations begin. Presentations will take place on April 9th. Details about the selection of an article and the contents of the presentation will be provided around January 31st as well.

**Grading**

Three computer assignments, an oral presentation about a published article using structural equation modeling, a research project (both an oral presentation and a written paper), and a midterm exam will comprise the grading in this course. The total grade will be distributed as follows:

- Homework Assignments: 24% (3 @ 8% each)
- Published Article Presentation: 10%
- Research Project—written component: 26%
- Research Project—oral presentation: 10%
- Quizzes (2 @ 10%): 20%
- Attendance/participation: 10%

Everyone should receive an “A” or a “B” barring poor attendance or not doing the work, so that students can spend more time and energy on learning the material rather than on their grade.

**Course Website**

The website for the course is at [www.uky.edu/centers/hiv/cjt765/cjt765.html](http://www.uky.edu/centers/hiv/cjt765/cjt765.html). The course syllabus, assignments, dataset to be used throughout the course (in SPSS format), additional readings (in PDF files), articles for the published article presentation, datasets, and a variety of other materials will be available on the course website.

**Acknowledgments**

I would like to acknowledge the following faculty members, whose syllabi helped provide some suggestions for assignments, readings, or course organization. I either spoke to these faculty members and/or their syllabi were available through publicly accessible websites. Copies of my syllabus have been shared with them.

- Rick Hoyle, Duke University, Psychology/Sociology 779, Structural Equation Modeling, taught Fall, 2000 at UK. (I have especially drawn on this syllabus for readings and assignments.)
<table>
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<tr>
<th>Date</th>
<th>Topic</th>
<th>References</th>
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<tbody>
<tr>
<td>Jan. 29</td>
<td>Review of correlation and regression</td>
<td>Kline: 2; Byrne: 1 Cohen et al. (2003): Ch. 2-3</td>
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| Feb. 12   | Overview of SEM notation, path diagrams, programs; **Homework 1 due** | Kline: 4; Hoyle: 1, 2, 8 Byrne: 3  
*Byrne (1994), Chapters 1 & 2  
*Kelloway (1998),Ch. 4-7  |
| Feb. 19   | Path Analysis 1: Basic theorems, mediation, coefficients, **Choose dataset**  | Kline: 5 pp. 93-105; Hoyle: 3  
Kenny (1979), Chapters 3-4  
Baron & Kenny (1986)  
MacKinnon et al. (2002)  
Cole & Maxwell (2003)  
Gionta et al. (2005)  
*Shrout & Bolger (2002) |
| Feb. 26   | Path Analysis 2: decomposing a correlation, direct and indirect effects, identification; **Quiz 1** | Kline: 5 pp. 105-122  
Alwin & Hauser (1975)  
Holbert & Stephenson (2001)  
Pedhazur (1982), pp. 614-628  
Fox (1980) |
| Mar. 5    | Path Analysis 3: fitting a model, fit indices, comparing models, statistical power; **Homework 2 due** | Kline: 6; Hoyle 3, 5  
Hayduk et al. (2003)  
Bollen & Long (1993)  
Tanaka (1993)  
Marsh et al. (2004)  
Fan & Sivo (2005)  
*Reichardt (2002)  
*Dormann, 2001  
*Muthén & Muthén (2002) |
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<th>Date</th>
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<th>References</th>
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<tr>
<td>Apr. 2</td>
<td>Nonrecursive structural models; Quiz 2</td>
<td>Kline: 9&lt;br&gt;James &amp; Singh, 1978&lt;br&gt;*Berry, 1984</td>
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<tr>
<td>Apr. 23</td>
<td>Research report presentations 1</td>
<td></td>
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<td>Apr. 30</td>
<td>Research report presentations 2</td>
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<tr>
<td>May 3</td>
<td>Research reports due, 10 a.m.</td>
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</tbody>
</table>
Additional Readings

January 22

January 29

February 5

February 12

February 19
Additional Readings (cont.)

February 26

March 5

March 19
Additional Readings (cont.)

March 26

April 2

April 9

April 16