Texas A&M University

Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. This request is submitted by the Department of Recreation, Park and Tourism Sciences

2. Course prefix, number and complete title of course: RPTS 678. Latent Variable Model Applications in the Leisure Sciences

3. Course description (not to exceed 50 words):
   Introduction to structural equation modeling (SEM); background on conceptual issues, application of the method, and insight on SEM software; measurement theory, missing data analysis, non-normal data, confirmatory factor analysis, path analysis, multi-group models.

4. Prerequisite(s): STAT 636 or approval of instructor.

5. Is this a variable credit course? □ Yes ☒ No  If yes, from _______ to _______

6. Is this a repeatable course? □ Yes ☒ No  If yes, this course may be taken _______ times.

   Will this course be repeated within the same semester? □ Yes ☒ No

7. Has this course been taught as a 489/689? ☒ Yes □ No If yes, how many times? _______

   Indicate the number of students enrolled for each academic period it was taught. 5 students - Fall 2006

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

   Ph.D. in RPTS and other social science disciplines.

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix Course # Title (excluding punctuation)
    RPTS C6 78

   Lect. Lab SCH CIP and Fund Code Admin. Unit Acad. Year FICE Code
   030000310101001250209-10003632

   Approval recommended by: 7/24/08
   Head of Department Date

   Head of Department (if cross-listed course) Date

   Submitted to Coordinating Board by:
   Associate Director, Curricular Services Date

   Effective Date

   Questions regarding this form should be directed to Sandra Williams at 845-8201.
   Curricular Services – 11/07
Course Syllabus
RPTS 690: Latent Variable Model Applications in the Leisure Sciences (3 credits)
Fall – 2008

Instructor
Gerard Kyle, Office: 253 Francis Hall, Phone: 979-862-3794, Fax: 979-845-0446, Email:
gerard@tamu.edu. Office hours are by appointment. Also, please feel free to call or email me
anytime.

Text
Byrne, B. M. (1998). *Structural equation modeling with LISREL, PRELIS, and SIMPLIS.*
Mahwah, NJ: Lawrence Erlbaum Assoc.

Optional Text
at the bookstore or used copies may be obtainable online. ISBN: 0-471-01171-1.

Prerequisites
STAT636 or approval of instructor.

Overview
This course is intended to introduce students to structural equation modeling (SEM). Structural
equation modeling (sometimes referred to as covariance structural analysis) is a regression-based
technique that incorporates elements of path analysis and confirmatory factor analysis. The
general goal is to provide a background in the conceptual aspects, an application of this method,
and insight on programming through LISREL.

Outcome
At the end of the course, students will have a solid, conceptual foundation of structural modeling
issues, be able to analyze data using LISREL software, critically evaluate professional articles,
and write-up SEM results. THIS COURSE SHOULD SERVE AS A PLATFORM FOR
FURTHER ENQUIRY.

Homework
There will be eight homework assignments which will primarily consist of data analysis and
write-ups of SEM problems using the student version of the statistical package LISREL. Some
data preparation and descriptive analysis using SPSS and PRELIS will be required. The student
(“demo”) version of LISREL 8.7 can be downloaded from the following internet site:
http://www.ssicentral.com/lisrel/downloads.html. The demo version limits use (for structural
equation models) to a maximum of 15 observed variables. Purchase of the LISREL users’
manual is not required, I will provide you with the necessary information.
Grading
Assignments:  1 – 2: 5 points each = 10 points  
               6 – 8: 12 points each = 72 points  
Final paper:  18 points 
Total=100 points

A=90-100 points  
B=80-89.9 points  
C=70-79.9 points  
D=60-69.9 points  
F<60 points

Other Resources
There are several internet sites devoted to SEM that may be of use. Dave Kenny has a great website with introductory material on most SEM topics at http://nw3.nai.net/~dakenny/causalm.htm. Ed Rigdon has an excellent site that serves as a gateway to most of the SEM sites on the web at http://www.gsu.edu/~mkteer/. There is a SEM discussion list called SEMNET which you can subscribe to (I think it would be a great idea if everyone would subscribe during this term) through the following site http://www.gsu.edu/~mkteer/semnet.html. Finally, the LISREL website (http://www.ssicentral.com/lisrel/index.html) also has lots of example programs.

Americans with Disabilities Act (ADA) Policy Statement
The following ADA Policy Statement (part of the Policy on Individual Disabling Conditions) was submitted to the University Curriculum Committee by the Department of Student Life. The policy statement was forwarded to the Faculty Senate for information. The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room B118 of Cain Hall or call 845-1637.

Academic Integrity : Aggie Honor Code

   “An Aggie does not lie, cheat, or steal or tolerate those who do.”

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the Texas A&M University community from the requirements or the processes of the Honor System. For additional information please visit: www.tamu.edu/aggiehonor/
On all course work, assignments, and examinations at Texas A&M University, the following Honor Pledge shall be preprinted and signed by the student:

“On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work.”

Cheating encompasses the following:
1. The willful giving or receiving of an unauthorized, unfair, dishonest, or unscrupulous advantage in academic work over other students.
2. The above may be accomplished by any means whatsoever, including but not limited to the following: fraud; duress; deception; theft; trick; talking; signs; gestures; copying from another student; and the unauthorized use of study aids, memoranda, books, data, or other information.
3. Attempted cheating.

Plagiarism encompasses the following:
1. Presenting as one's own the words, the work, or the opinions of someone else without proper acknowledgment.
2. Borrowing the sequence of ideas, the arrangement of material, or the pattern of thought of someone else without proper acknowledgment.

Depending on the severity of the indiscretion, cheating and plagiarism may result in automatic course failure.

Comments on Learning Statistics
Statistics of any kind is very difficult topic to learn. However, keeping in mind the following points learning statistics should greatly facilitate your learning in this course.

- **It's not like math, it is like math.** Statistics is considerably different from mathematics. In fact, the math required for this course is no more complex than what is needed to balance a check book. Statistics is like mathematics, however, in that it must be practiced to be learned. One has to work on exercises, analyze different problems, and get experience with different analytic situations in order to absorb the information. Do not think that you can just read through the material and remember everything. You may need to reread and apply the material several times. *So, don't wait until the last minute!*
- **It's like a foreign language.** Statistics does, however, use a lot of symbols like Greek letters, and for this reason it is a bit like learning a foreign language. Think of the symbols as a foreign language vocabulary that has to be learned in order to understand the sentences.
- **It's like other courses.** In this course, there will also be a great deal of practical, conceptual, and other substantive information that will have to be learned; so, you will also have to read the text material, study concepts, and do some memorization like other substantive courses.
- **It's progressive.** Everything builds on everything else. Don't let any misunderstandings slip through the cracks, or it will snowball on you.
- **It's weird.** Statistics is a unique and unusual topic involving some very abstract and weird ideas. The peculiar nature of the subject makes the material very difficult to learn and retain. Despite its seemingly abstract nature, statistics are extremely useful tools that will make you a highly skilled and valued researcher.
Course Schedule/Readings
RPTS 689: Latent variable Model Applications in the Leisure Sciences
Fall 2008


Week 1, August 27th: Overview of SEM & SEM Assumptions

Reading
Byrne, Chapter 1, “Structural Equation Models: The Basics”

Additional
Maruyama, Chapter 2, “History and logic of structural equation modeling”
Bollen, Chapter 1, “Historical background”
Bollen, Chapter 2, “Model Notation, Covariances, and Path Analysis

Assignment 1: Conceptual factor analysis – due September 15th
Assignment 2: Scale construction - due September 15th

Week 2, September 3rd: NO CLASS

Week 3, September 10th: Exploratory Factor Analysis/Confirmatory Factor Analysis

Reading
Byrne, Chapter 3, “Application 1: Testing the factorial validity of a theoretical construct (first-order CFA model)”

Additional
Maruyama, Chapter 7, “Introducing the logic of factor analysis and multiple indicators to path modeling
Bollen, Chapter 6, “Measurement models: The relation between latent and observed variables”

Assignment 3: Exploratory factor analysis with SPSS – due September 22nd

Week 4, September 17th: Confirmatory Factor Analysis

Reading
Byrne, Chapter 3, “Application 1: Testing the factorial validity of a theoretical construct (first-order CFA model)”
Byrne, Chapter 4, “Testing the factorial validity of scores from a measuring instrument”

Additional
Maruyama, Chapter 7, “Introducing the logic of factor analysis and multiple indicators to path modeling
Bollen, Chapter 6, “Measurement models: The relation between latent and observed variables”

Assignment 4: Confirmatory factor analysis with LISREL – due September 29th

**Week 5, September 24th: Confirmatory Factor Analysis II – Identification**

**Reading**
Byrne, Chapter 3, “Testing the factorial validity of a theoretical construct”

**Additional**
Maruyama, Chapter 10, “Logic of alternative models and significance tests”

Assignment 5: Testing model identification – due October 6th

**Week 6, October 1st: Multiple Group CFA**

**Reading**
Byrne, Chapter 8, “Testing for invariant factorial structure of a theoretical construct (first-order CFA model)”
Byrne, Chapter 9, “Testing for invariant factorial structure of scores from a measuring instrument (first-order CFA model)”

**Additional**
Maruyama, Chapter 11, “Variations on the basic latent variable structural equation model”.

Assignment 6: Multiple group CFA – due October 21st

**Week 8, October 8th:** Multiple Regression/Path Analysis

**Reading**
Byrne, Chapter 7, “Testing the validity of a causal structure”

**Additional**
Maruyama, Chapter 8, “Putting it all together: Latent variable structural equation modeling”

Assignment 7: Latent variable path analysis – due October 27th

**Week 9, October 14th:** NO CLASS

**Week 10, October 21st:** Multiple Group Models/Second-Order Models

**Reading**
Byrne, Chapter 5, “Testing the factorial validity of scores from a measuring instrument (second-order CFA model)
Byrne, Chapter 11, “Testing for invariant pattern of causal structure”

**Week 11, October 29th:** Handling Missing Data and Non-Normal Data

**Reading**
Graham, Cumsille, & Elek-Fisk, “Methods for handling missing data”
Additional for non-normality


Assignment 8: Model comparisons with complete and incomplete data – November 10th

Week 12, November 5th: Writing Up Modeling Results and Critiques of SEM

Reading

Maruyama, Chapter 12, “Wrapping Up”


Week 13, November 12th: Latent Growth Curve Modeling

Week 14, November 19th: Wrapping Up

- Other SEM models
- Final paper/presentations

Exam Week, Date TBA: Presentations

Final paper due.
From: "Jim Petrick" <jpetrick@ag.tamu.edu>
To: "Lynette Huval" <LHuval@ag.tamu.edu>
Date: Monday, September 22, 2008 2:22 PM
Subject: Fwd: RE: Dr. Longnecker:

Hy Lynette,

The below is a letter from the Statistics Department granting us the go ahead for our new course. Can you move this forward with the rest of the paperwork?

Jim

"Michael Longnecker" <longneck@stat.tamu.edu> 9/16/2008 11:32 AM

Dear Gerard:

The Department of Statistics has no objection to your teaching of RPTS 690, Latent Variable Model Applications in the Leisure Sciences, provided that STAT 652 or STAT 636 continues to be prerequisites to the course. Please contact me if you need any further support for your course.

Mike

Michael Longnecker
Professor/Associate Department Head
Department of Statistics
Texas A&M University

-----Original Message-----
From: Gerard T Kyle [mailto:gtkyle@ag.tamu.edu]
Sent: Thursday, September 11, 2008 3:09 PM
To: longneck@Stat.tamu.edu
Cc: Jim Petrick; Marguerite Van Dyke
Subject: Dr. Longnecker:

Dr. Longnecker:
Dr. John Crompton passed your name along to me. I am attempting to have a course listed focusing on structural equation modeling applications (see attached syllabi). Yesterday, the college's (ag and life sciences) graduate programs committee met to review proposals for new classes. They have given approval for the class to proceed to the next level of review (university wide) but suggested I get some form of approval from the statistics department. The reason I am proposing the class within our own department is because the only other comparable offering is housed within ed psych (EPSY651). Priority is given to ed psych students so our own miss out. I have been using the technique for over 10 years with over two dozen peer-reviewed publications (using the technique) and am currently teaching the class for the second time this fall using a 689 designation. Would it be possible for you or someone within the department reply email me indicating that the department does not object to us offering the class? I'd be happy to discuss further should you need additional information?
Sincerely,
Gerard

Gerard T. Kyle
Associate Professor
Department of Recreation, Park & Tourism Sciences
Texas A&M University
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College Station, TX 77843-2261
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Fax: (979) 845-0446
Email: gerard@tamu.edu
Hi, Suzie,

I should have copied you on this, but I forgot.

Emily S. Davidson, Ph.D.
Associate Professor of Psychology
Department of Psychology
Texas A&M University
College Station, TX 77843
979 845-2501
979 845-4727 (fax)
edavidson@psych.tamu.edu

From: Davidson, Emily
Sent: Tuesday, October 07, 2008 11:39 AM
To: Gary Ellis
Subject: Stats course

Hi,

Attached is a letter of approval from Dr. Morey, our department head, approving the development of RPTS 678.

Emily S. Davidson, Ph.D.
Associate Professor of Psychology
Department of Psychology
Texas A&M University
College Station, TX 77843

979 845-2501

979 845-4727 (fax)

edavidson@psych.tamu.edu
Date: October 7, 2008

To: Dr. Gary Ellis
   Head, Recreation, Park and Tourism Sciences
   Texas A&M University

From: Dr. Les Morey
      Head, Department of Psychology
      Texas A&M University

Re: RPTS 678: Latent Variable Model Applications in the Leisure Sciences

After discussion with relevant faculty, the Department of Psychology has no objection to the development of this course.