IRLS 696b-001 ISSUES & WRITING SEMINAR: Advanced Research Methods & Statistics (By Heshan Sun)

Updated Mon, 01/03/2011 - 14:42

COURSE NAME, NUMBER AND PREREQUISITES:

IRLS 696b-001 ISSUES & WRITING SEMINAR: Advanced Research Methods & Statistics (3 credit hours)

Instructor: Heshan Sun

Prerequisite: IRLS 506 or alternatively, a research method course taken somewhere else. Please contact the instructor for the appropriateness of the research method courses you have taken outside SIRLS.

The course requires basic skills in statistics. Concepts such as mean values and standard deviations should sound familiar to the participants. In addition, a basic understanding of factor analytic approaches, regression analysis as well as testing procedures is helpful but not an essential requirement for understanding the contents. A recap session on elementary statistics is integrated into the course.

COURSE DESCRIPTION:

IRLS 696b-001 ISSUES & WRITING SEMINAR: Advanced Research Methods & Statistics (3 credit hours)

This course consists of a survey of research methods and statistics which relate to the following topic areas: (1) research method issues, (2) statistics, (3) application of structural equation modeling (SEM), and (4) data collection techniques.

Structural Equation Modeling (SEM) is a general statistical modeling technique to establish relationships among variables. SEM grows out of and serves purposes similar to multiple regression and has been widely utilized in many social science disciplines. A key feature of SEM is that observed variables are understood to represent a small number of "latent constructs" that cannot be directly measured, only inferred from the observed measured variables. Accordingly, SEM is helpful for understanding complex phenomena where abstract concepts of interests cannot be observed and measured directly and where complex relationships are examined. This course covers the basis of SEM, and includes practical work with computer software and real data.

This course is a synthesis of theory and practices and has three major components (A more detailed table of weekly activities and reading list will be available in the first week of the course and is available upon request from the instructor)

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<tr>
<th>Sections</th>
<th>Content</th>
<th>Activities</th>
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<tr>
<td>1. Theory</td>
<td>Philosophy of Science; Research Methodologies</td>
<td>Lectures, class discussions, case studies, reflection papers.</td>
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<tr>
<td>(Weeks 1-5)</td>
<td>Research design</td>
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<td>Validity, reliability issues</td>
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<td>Scientific validation</td>
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<td>Sampling</td>
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<td>Research ethics</td>
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<td>2. Practices</td>
<td>A recap of basic statistics</td>
<td>Class discussion</td>
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<td>(Weeks 6-12)</td>
<td>Introduction to Structural Equation</td>
<td>Student-led discussion</td>
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<td></td>
<td>Modeling (SEM in general and Partial</td>
<td>Exercise sessions on data analysis</td>
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<td>Least Square (PLS) in particular.</td>
<td>using PLS</td>
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<td>Exercises of SmartPLS (a software</td>
<td>Individual projects</td>
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<td></td>
<td>application for PLS).</td>
<td>In-class case studies</td>
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COURSE OBJECTIVES:

Successful completion of this course will help students achieve the A2 competency outlined at http://sirls.arizona.edu/about/studentCompetencies. More specifically, by the end of the semester, students will be able to:

- have a sound understanding of the bases for research designs
- to define in your own words terms like theory, variables, constructs, hypotheses, controls, manipulation, randomization, validity, reliability, operationalization, and measurement.
- be able to critically interpret the results of your and others' analyses.
- be able to use the software programs SPSS and SmartPLS to carry out fundamental analyses to successfully conduct their own research projects.
- be able to use Partial Least Square(PLS), a component-based SEM technique, for data analysis.
- be able to interpret the results of regression, ANOVA, and SEM.
- be able to write the report of data analysis (the data analysis and results sections in a typical empirical paper).
- have a basic understanding of advanced analysis issues in SEM, including moderating effects, mediating effects, and reflective and formative factors.

REQUIRED COURSE MATERIALS:

Textbooks (It is recommended that you get at least one of them):


Professor William Trochim generously provides a web-based version of the textbook, free of charge:


The instructors will make available other reading materials in D2L throughout the course.

Software applications: You are required to have two software applications:

-- SPSS. SPSS for Windows is a modular full-featured product for the analytical process-statistical, data entry, data access and management, analysis, and reporting. You can purchase a license of SPSS from: http://www.studentdiscounts.com/

-- SmartPLS. SmartPLS is a software application for (graphical) path modeling with latent variables (LVP). You can download it free of charge at http://www.smartpls.de.

COURSE REQUIREMENTS:

Students are anticipated to:
1. participate in weekly lecture and class discussion. Lecturers will use recent journal articles as well as book chapters, facilitated by the notes, to teach the participants the state-of-the-art of research methods and structural equation modeling issues. Participants are responsible for reading the assigned materials before class.

2. lead a discussion session. Each student will serve as a discussion leader and prepare a 1-2 page (single spaced) write-up on an assigned article. They will distribute a copy of the write-up and lead the class discussion. The write-up should be a written repository of the interpretation of the article by the reader.

3. write an article evaluation. You need to be critical in evaluating the article, applying what you’ve learned from this course as much as possible. The article evaluation could include responses to questions like (1) what are the research methods of the research and how methodologically sound they are? (2) how reliable and valid is this research? (3) what are the threats to the scientific validation of this research? (4) what additional analyses the authors can do to make their results more convincing? Etc.

4. conduct data analysis and write a report. Students will analyze some real data provided by the instructor. You will use SmartPLS and SPSS for data analysis. You will write a report of your analyses and findings and do a class presentation on your project.

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<tr>
<td>-- Article evaluation</td>
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<td>-- Data analysis and report</td>
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<td>Discussion Leadership</td>
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<td>Reflection papers</td>
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<td>-- Paper # 1</td>
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<td>-- Paper # 2</td>
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<td>-- Paper # 3</td>
<td>10%</td>
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<tr>
<td>Class participation</td>
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<tr>
<td>Total</td>
<td>100%</td>
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**COURSE, SCHOOL, AND UNIVERSITY POLICIES:**

**Academic Code of Integrity**

Students are expected to abide by The University of Arizona Code of Academic Integrity. ‘The guiding principle of academic integrity is that a student’s submitted work must be the student’s own.’ If you have any questions regarding what is acceptable practice under this Code, please ask an Instructor.

**Accommodating Disabilities**

The University has a Disability Resource Center. If you anticipate the need for reasonable accommodations to meet the requirements of this course, you must register with the Disability Resource Center and request that the DRC send me, the Instructor, official notification of your accommodation needs as soon as possible. Please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate.

**Assignment Policies**

**Submission:** The papers are to be submitted usually by the d2l assignment Dropbox, which can be found as a link on the toolbar. (A less preferable alternative is by d2l internal email to the Instructor, put, for example, ‘Assignment One’ as the subject and send the assignment either as the message or as an attachment to the message. Pure electronic documents
need to be formatted using HTML (just 'Save As' HTML using your favorite word processor).

**Format, style and content:** Content is all important in this course. Style should be plain and transparent (be guided by the classic Strunk and White Elements of Style). The format is unimportant, except that it should be html. Using headings and sub-headings to organize your papers. Late papers: There will be due dates and students are expected to meet them. Unanticipated lateness resulting from poor planning or procrastination is highly undesirable. 5% of the credits of the assignment will be deducted for each day late (e.g., if the assignment was due on Tuesday and you submit it on Wednesday, you lose 5% of the credits. If you submit it Thursday, you lose another 5%).

**Incompletes**

The current Catalog reads

The grade of I may be awarded only at the end of a term, when all but a minor portion of the course work has been satisfactorily completed. The grade of I is not to be awarded in place of a failing grade or when the student is expected to repeat the course; in such a case, a grade other than I must be assigned. Students should make arrangements with the instructor to receive an incomplete grade before the end of the term ...

If the incomplete is not removed by the instructor within one year the I grade will revert to a failing grade.

**GRADING:**

**General grading criteria:** For ordinary papers, and unless specified otherwise, you should write about the equivalent of four pages of ordinary text. Grammar, style, or spelling are not central--provided the paper is understandable and the faults are not so severe as to be a distraction. Then, important grading criteria include:

- clear articulation of your views and arguments
- clear and concise exposition of the points you are making
- soundness of what is said
- appropriate selection and execution of statistical methods
- consideration of intellectual context and relevant literature

**How to find out your grades:** Grades will be administrated in D2L. D2L has two main ways to help a student find grades. There is a link on the toolbar named 'Grades' which, if clicked on, will display all the grades. Second, if a student clicks on a submitted and graded assignment in the Dropbox, the grade, and feedback comments from the Instructor, will be displayed.

**INSTRUCTOR NAME AND CONTACT ADDRESSES:**

You can contact me by email. When the course is up and running and you are a registered student, use the course's internal D2L email (this is best for me as it keeps material related to this course in one place). Failing that, use ordinary email to hsun(AT)u.arizona.edu.

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