Quantitative Methods in Information Systems Research
CIS 786-002
Syllabus
Spring 2007

Instructor: David Mendonça, Ph.D.
Class: Location and time TBA
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Office Hours: TBA
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Course Website: web.njit.edu/~mendonca/quantmeth

1. Overview
This course is a practical and project-oriented introduction to quantitative methods in information systems (IS) research. The focus of the course is on developing researchers’ capability to select and implement appropriate statistical procedures for a variety of research questions and to interpret the results of these procedures. The course makes extensive use of existing data sets from information systems-related research projects.

1.1. Course Objectives
• Improve capability to address methodological issues that are particularly relevant to IS research
• Gain practical experience in the analysis and interpretation of statistical data.
• Become familiar with computer-based analytic tools.
• Produce a written document that summarizes the analysis of one data set.

1.2. Content
Topics in the following areas will be covered:
• Fundamentals: measurement, reliability, validity
• Model construction and validation
• Power analysis and hypothesis testing
• Common methods and their non-parametric analogues (e.g., simple and multiple regression, including diagnostics; ANOVA)

1.3. Products
- Periodic class presentations
- A detailed data analysis, in the form of a research note, that can serve as the foundation for a conference-quality submission.

1.4. Prerequisites
Math 661 or equivalent; B+ or better in CIS 675.

1.5. Format
Weekly lecture and occasional lab
Course details

Course Texts:

There will be numerous readings from the information systems literature (taken from those listed in the course outline, below). Copies of course readings not readily available in the open literature will be kept on library reserve.

It is highly recommended that you find a mathematical statistics book that is or is similar to one in the Optional References list below.

Required softwares

• One word processing program (e.g., Microsoft Word)
• One citation management tool (e.g., ProCite or EndNote)
• SAS® v.9 from SAS Institute. The set of CDs is available through the Campus Computer Store for a nominal fee (includes full electronic documentation).
• Note: the course requires basic networking skills in UNIX and Windows.

Optional References (items marked with * can usually be found for less than $10)
4. Conover. *Practical Nonparametric Statistics*
6. Fraleigh&Beauregard. *Linear Algebra*
8. Kutner et al. *Applied Linear Statistical Models*
10. Ross. *Introduction to Probability Models* ("Ross")
11. Weisberg. *Applied Linear Regression*
Performance Assessment
- Project Report Part I: Project Motivation and Description, Descriptive Statistics (35%)
- Project Report Part II: Analysis of Results, Discussion, Conclusions (60%)
- Presentations to class (5%)

Note on Report Writing
- Use APA Guidelines for formatting your paper. The style is available for EndNote.
- Papers should be double-spaced, with 1-inch left, right, top and bottom margins. They must be text with paragraphs, full sentences and all the other appurtenances of a written presentation: they cannot be itemized lists of points. Text font size should be either 10 or 12 points. You may choose your own font style, but a serif font is preferred.
- There are numerous guides to writing. The following texts point out some of the more common pitfalls and corresponding remedies:

About the Instructor
Dr. Mendonça is an Associate Professor in Information Systems at New Jersey Institute of Technology. He holds a Ph.D. in Decision Sciences and Engineering Systems from Rensselaer Polytechnic Institute. His research interests are in modeling and supporting human decision making.
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<tr>
<th>Week</th>
<th>Topics</th>
<th>Reference Text(s)</th>
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<td>1</td>
<td>Overview of quantitative methods in IS</td>
<td>[Avgerou, 2000 #45; Palvia, 2004 #75; Podsakoff, 2003 #81; Zigurs, 1993 #96]</td>
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<tr>
<td>1</td>
<td>Lab: Intro. to computer lab</td>
<td>Handout</td>
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<td>2</td>
<td>Measurement</td>
<td>[Roberts, 1979 #83]</td>
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<td>3</td>
<td>The art of modeling</td>
<td>[McLaughlin, 1999 #74]</td>
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<td>4</td>
<td>Interval estimation/hypothesis testing</td>
<td>[Bain, 1992 #876/Ch. 11; Shrowt, 1997 #89]</td>
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<td>5</td>
<td>Data presentation and visualization</td>
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<td>5</td>
<td>Lab: Data visualization</td>
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<td>6</td>
<td>Power analysis</td>
<td>[Baroudi, 1989 #49]</td>
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<td>Nonparametrics I</td>
<td>Handout: Efron&amp;Tibshirani, &quot;An Introduction to the Bootstrap&quot; [Wilcox, 2003 #94]</td>
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<td>8</td>
<td>Validity</td>
<td>Required: [Carmines, 1979 #675/Chs. 1&amp;2]  Optional: [Schwab, 1980 #86; Boudreau, 2001 #55; Straub, 1989 #90; Bernard, 2003 #52; Hunter, 2001 #65; Burnkrant, 1982 #59]</td>
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<td>9</td>
<td>Model diagnostics and validation</td>
<td>Weisberg &quot;Diagnostics I,&quot; &quot;Diagnostics II&quot;; Neter et al. 3</td>
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<td>9</td>
<td>Lab: Model diagnostics and validation</td>
<td>Handout [Bartolucci, 2005 #50; Banks, 1999 #48; Kelley, 2003 #68]</td>
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<td>10</td>
<td>Model diagnostics and validation II (Exemplars)</td>
<td>[Sethi, 1994 #88; DeSanctis, 1989 #62; DeLone, 2001 #61; Böckenholt, 1994 #53; Todd, 1987 #93]</td>
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<td>11</td>
<td>Nonparametrics II</td>
<td>Alternatives to linear models (Banks et al. 1999)</td>
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<td>Lab: Nonparametric regression</td>
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<td>12–13</td>
<td>Reliability</td>
<td>Required: [Carmines, 1979 #675/Chs. 3&amp;4], Optional: [Perreault, 1989 #77; Parameswaran, 1979 #76; Rust, 1994 #85; Cohen, 1960 #60; Bakeman, 1997 #47; Peterson, 1995 #80]</td>
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<td>13</td>
<td>Reliability assessment</td>
<td>Handout</td>
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<td>14</td>
<td>Factor analysis for reliability and validity assessment</td>
<td>[Carmines, 1979 #675/Appendix]</td>
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<td>14</td>
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<td>15</td>
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Reference Texts


