

Quantitative Methods in Information Systems Research
CIS 786-002
Syllabus
Fall 2005

Instructor: David Mendonça, Ph.D.

Class: Monday/Wednesday 10:00AM–11:25AM

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1. Overview

This course is a practical and project-oriented introduction to quantitative methods in information systems 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 (usually provided by faculty members) from information systems-related research projects.

1.1. Course Objectives

- Gain practical experience in the analysis and interpretation of statistical data.
- Become familiar with SAS®, an industry-standard statistical package.
- Produce a written document (of at least workshop quality) that summarizes your analysis.

1.2. Content

Topics in the following areas will be covered:

- simple and multiple regression, including diagnostics;
- non-parametrics (especially non-parametric analogues of important parametric methods, such as ANOVA);
- multivariate analysis; and
- elementary spatial data analysis.

Data sets will be provided, though it will be possible for students to use data they have obtained on their own.

1.3. Product

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

B+ or better in (i) CIS 675 or (ii) a graduate-level course in mathematical statistics (e.g., Math 661).

1.5. Format

Weekly lecture and occasional small-group recitation

2. Course details

Required textbook : There is no required textbook; however, it is highly recommended that you find a mathematical statistics book that covers the topics in the first half of the course. In addition, there will be numerous readings from the information systems literature. **All course readings will be kept on library reserve.**

Required softwares:

- SAS® from SAS Institute. The 10-CD set is available through the Campus Computer Store for \$30. Full documentation in electronic format is included.
- One word processing program (e.g., Microsoft Word)
- One citation management tool (e.g., ProCite or EndNote)
- Note: while SAS provides some data visualization capability, you may also want to have access to another (e.g., Microsoft Excel).
- Note: the course requires basic networking skills in UNIX and Windows.

Optional References (items marked with * can usually be found for less than \$10)

1. Bain&Engelhardt. *Introduction to Probability Theory and Mathematical Statistics* ("B&E")
2. Bulmer. *Principles of Statistics* (*)
3. Cohen. *Empirical Methods for Artificial Intelligence*
4. Conover. *Practical Nonparametric Statistics*
5. Crow et al. *Statistics Manual* (*)
6. Fraleigh&Beauregard. *Linear Algebra*
7. Johnson&Winchern. *Applied Multivariate Statistical Analysis* ("J&W")
8. Neter et al. *Applied Linear Regression Models*
9. Ross. *Applied Probability Models with Optimization Applications* (*)
10. Ross. *Introduction to Probability Models* ("Ross")
11. Weisberg. *Applied Linear Regression*

2.1. Performance Assessment

- Paper Part One: Project Motivation and Description, Descriptive Statistics (30%)
- Paper Part Two: Analysis of Results, Discussion, Conclusions (60%)
- Presentation to class on research results (5%)
- Assignments (satisfactory/unsatisfactory) (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:
 - Strunk, Jr., W. and White, E.B. *The Elements of Style*. Macmillan, New York, 1979.
 - Watkins, F., Dillingham, W. and Hiers, J.H. *Practical English Handbook*. Houghton Mifflin, Boston, 2000 (11th Edition).

About the Instructor

Dr. Mendonça is an Assistant 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.