BAD 84023: Linear Statistical Models
Fall 2013

Instructor: Murali Shanker
Class Time: 6:35 - 9:20 p.m., Mondays
Class Location: Bowman Hall 00223
Room: A404 BSA
Office Hours: M, 5:00 - 6:30 p.m.

Course Description

Linear Statistical Models for regression, analysis of variance, and experimental design are widely used in fields of business. Use of these models requires a fundamental understanding of both the theory, and their practical applications to problems. This course balances theory and application, and provides several opportunities for application to practical problems.

Learning Outcomes

Students successfully completing this course will be able to understand and prove standard results related to linear statistical models, and apply these models to applications in various fields. Specific areas include:

- Linear regression with one predictor variable
- Matrix approach to linear regression
- Multiple linear regression
- Regression models for quantitative and qualitative predictors
- Inferences in regression and correlation
- Simultaneous inferences
- Building regression models: Selection and validation
- Diagnosis and remedial measures
- Introduction to non-linear regression
- Logistic regression
- Single-factor studies

Course Requirements

Last day to withdraw from a course: **Sunday, 3 November 2013**

Prerequisites: Ph.D. student in good standing.

Students With Disabilities: University policy 3342-3-01.3 requires that students with disabilities be provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact the instructor at the beginning of the semester to make arrangements for necessary classroom adjustments. Please note, you must first verify your eligibility for these through Student Accessibility Services (contact 330-672-3391 or visit http://www.registrars.kent.edu/disability/ for more information on registration procedures).

Academic Honesty: Cheating means to misrepresent the source, nature, or other conditions of your academic work so as to get undeserved credit. In addition, it is considered cheating when one cooperates with someone else in any such misrepresentation. The use of the intellectual property of others without giving them appropriate credit is a serious academic offense. It is the University's policy that cheating or plagiarism result in receiving a failing grade for the work or course. Repeat offenses result in dismissal from the University.

Course Content and Instruction

Textbook: Applied Linear Statistical Models, Fifth Edition, Kutner, Nachtsheim, Neter, Li. McGraw Hill. ISBN 978-0-07-310874-2.

- The student solutions manual, including links to the data sets in the book, and copies of the first three chapters from Edition 4 can be accessed at https://netfiles.umn.edu/users/nacht001/www/nachtsheim/index.html
- The Student Solutions manual, and data file for the 5th Edition can be found at https://netfiles.umn.edu/users/nacht001/www/nachtsheim/5th/

Statistical Software: This course will use SAS OnDemand with Enterprise Guide. To request access to this, please do the following:

1. Go to http://support.sas.com/ondemand/index.html
2. Follow the instructions given in http://support.sas.com/ondemand/manuals/enterprise_guide_student.pdf
3. Our course on the SAS server is BAD 84023 - Section 001. To access files that are uploaded to this course, use the following statements:
    a. libname mydata "/courses/u_kent.edu1/i_353717/c_6146" access=readonly;
    b. filename sample "/courses/u_kent.edu1/i_353717/c_6146/sample.csv";
4. If you using a Mac, the Enterprise Guide software will not run. In which case, you can access SAS from within JMP. Go to http://support.sas.com/ondemand/jmp.html#three for instructions on using SAS from within JMP. Also, look at http://www.jmp.com/learn to get instructions for using JMP to access SAS. Specifically, follow the instructions in View One-Page Guide to set up JMP to access the SAS OnDemand Servers.
5. JMP is available at no cost to all students, and can run on both Windows and Mac computers. To get a copy of JMP please go to JMP at Kent State.

Statistical Software Help: The following links provide links to tutorials, guides, and other instructions.

- OnDemand Main Page: http://support.sas.com/ondemand
- Enterprise Guide tutorial: http://support.sas.com/documentation/onlinedoc/guide/tut51/en/menu.htm
- Learn how using SAS Enterprise Guide: http://support.sas.com/learn/statlibrary/statlib_eg4.2/top_learn.htm
- Enterprise Guide student manual: http://support.sas.com/ondemand/manuals/StudentManual.pdf
- SAS Documentation: http://support.sas.com/documentation/index.html
- OnDemand White Paper: http://support.sas.com/resources/papers/proceedings12/152-2012.pdf
- Michael Friendly's guide to SAS resources: http://www.math.yorku.ca/SCS/StatResource.html#SAS
- Brian Yandell's introduction to SAS: http://www.stat.wisc.edu/~yandell/software/sas/intro.html
- UCLA SAS resources http://www.ats.ucla.edu/stat/sas/

Assessments

Your grade will be based on your performance of the following assessments.

- Weekly individual assignments (approximately 8) - 80%
- Individual topic presentation - 20%

Content Outline

Content Hours	Chapters	Topic Description
10	1-5	Simple Linear Regression • Linear Regression with One Predictor Variable • Inferences in Regression and Correlation Analysis • Diagnostic and Remedial Measures • Simultaneous Inferences and Other Topics in Regression Analysis
20	6-12	Multiple Linear Regression • Multiple Regression I • Models for Quantitative and Qualitative Predictors • Model Selection and Validation • Diagnostics • Remedial Measures • Autocorrelation in Time Series Data
15	15-18	Design and Analysis of Single-Factor Studies • Introduction to the Design of Experimental and Observational Studies • Single Factor Studies • Analysis of Factor-Level Means • ANOVA Diagnostics and Remedial Measures
		Student Presentations