**Statistical Methods I: Topics in Regression Analysis, Correlation
and Analysis of Variance**
Math 646/746
Fall 2009
Course Syllabus

Instructor: Dr. Jayawardhana   Phone: 235-4414
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Office Hours: Check the timetable below
Class web page: http://faculty.pittstate.edu/~ananda/STATMETHODI/statmeth1.html
Web page for examples: http://faculty.pittstate.edu/~ananda/STATMETHODI/fun.html

Text: Applied Linear Statistical Models by Kutner, Nachtsheim, Neter and Lee
                5th edition.

Prerequisites: Math 543 (Probability and Statistics)

Coverage: Simple Linear Regression, Multiple Linear Regression, Correlation
                Analysis, Analysis of Variance, and SAS programming basics.

Part I   Simple Linear Regression
        Chapter 1.   Linear Regression with One Predictor Variable
        Chapter 2.   Inferences in Regression and Correlation
        Chapter 3.   Diagnostic and Remedial Measures
        Chapter 4.   Simultaneous Inferences and Other Topics in Regression Analysis
        Chapter 5.   Matrix Approach to Simple Linear Regression

Part II Multiple Linear Regression
        Chapter 6.   Multiple Regression I
        Chapter 7.   Multiple Regression II
        Chapter 8.   Regression Models for Quantitative and Qualitative Predictors
        Chapter 9:   Building the Regression Model I: Model Selection and Validation
        Chapter 10:   Building the Regression Model II: Diagnostics
        Chapter 11:   Building the Regression Model III: Remedial Measures*?????
        Chapter 12:   Autocorrelation in Time Series Data *?????

Part IV: Design and Analysis of Single Factor Studies
        Chapter 15:   Introduction to the Design of Experimental and Observational
                        Studies
        Chapter 16:   Single Factor Studies
        Chapter 17:   Analysis of Factor Level Means
        Chapter 18:   ANOVA Diagnostics and Remedial Measures

Objectives: First objective of this course is to learn in detail about the assumptions, how to check the assumptions, how to correct the violations of the assumptions, and how to apply the mathematical theory and statistical programming to regression and interpret the results.

Second objective of this course is to learn in detail about the correlation and how to apply the mathematical theory and statistical programming to correlation and interpret the results.

Third objective of this course is to learn in detail about the assumptions, how to check the assumptions, how to correct the violations of the assumptions, and how to apply the mathematical theory and statistical programming to analysis of variance and interpret the results.

Forth objective of this course is to improve the skills of statistical thinking and writing statistical reports.

Evaluation: Mid term exam (take home)   = 75 points
             Mid term exam (in class)   = 25 points
             End of semester exam (take home) = 75 points
             End of semester exam (in class) = 25 points
             Homework   = 200 points (rescaled)
             Quizzes   = 100 points
             Semester paper (and presentation) = 25 points
             Group projects   = 40 points

Grading Scale: 90% - 100%   = A
                     80% - 89%   = B
                     70% - 79%   = C
                     60% - 69%   = D
                        <60%   = F

Instructor keeps the right to lower the scale if necessary. Homework assignments are often different in length. Students will have the opportunity to submit homework up to a week late twice during the semester. After that late homework will not be graded. If you get a call during the class, please walk outside and answer. **I will not tolerate students playing with electronic gadgets in class.**

Other references:

Myers, R. H. (1990) Classical and Modern Regression with Applications, 2nd edition

Montgomery, D. (1984) Design and Analysis of Experiments, 2nd edition

SAS Users Guide: Basics version 6 edition

SAS/STAT Users Guide, Release 6.03 edition

SAS System for Regression, 2nd edition

Literature Survey

Learn how to search online databases.

Learn how to request an inter-library loan.

We have access to many databases including JSTOR . In JSTOR, search for Regression Analysis. There may be several hundred papers. Read a few and select one article for your presentation.

Regression Analysis is a vast subject and its applications can be found in many areas of social sciences and business. Since we have covered only a limited number of topics during this semester, you may encounter many new concepts in research papers. I will help you to understand those topics if possible.

Semester Papers and Class Presentations

These papers should be from about 5-10 pages in length (double-spaced, font size 12). You have the choice to select your own topic. If you do so please let me know in advance. You can use publicly available data sets for your analysis. Instructor will help you find a topic if you do not want to find your own topic.

Group Projects

You are expected to critique the statistical analysis of four articles provided by the instructor. You may consider these as reaction papers. You can discuss with your classmates but write papers individually. These papers should be 2 to 3 pages long. There will be a class discussion afterwards.

Instructor's Time-table

	Monday	Tuesday	Wednesday	Thursday	Friday
8.00-8.50 MWF	Math 143 YH 215	Office	Math 143 YH 215		Math 143 YH 215
9:30-10.45 TH 9.00-10.00 MWF	Office	Math 646/746 YH 216	Office	Math 646/746 YH 216	Office
10.00-10.50 MWF	Math 543-01 YH 106		Math 543-01 YH 106		Math 543-01 YH 106
11.00-12.00 TH	Office	Office	Office	Office	Office
12.00-1.00	Lunch	Lunch	Lunch	Lunch	Lunch
1.00-2.00					
2.00-3.00					
7.00-9.00					

Programming for the class.

- SAS using PC
- MINITAB
- EXCEL