STAT 5167
Statistics in Applications II
SPRING SEMESTER 2016

Instructor:	Xu-Feng Niu; niu@stat.fsu.edu
Class Hours:	11:00am - 12:15pm MW (Room HCB 205)
Office Hours:	12:30pm - 1:30pm MW
Text:	Weisberg, S. (2014), Applied Linear Regression (Fourth Edition), John Wiley and Sons, Inc.

Course Objectives: We will spend the beginning of the semester on some special topics in experimental design. Random-effects models, mixed-effects models and other types of designs will be briefly discussed. The remainder of the course will be on linear regression analysis, which consists of a collection of techniques used to explore relationships between variables. Regression analysis is interesting both theoretically because of the elegance of the underlying theory, and from an applied point of view, because of the wide variety of uses of the techniques in many fields. The topics of this course include simple and multiple linear regressions, weighted least squares,diagnostic checking techniques, incomplete data analysis, analysis of unbalanced data, nonlinear regression and logistic regression. The course will use "R" as the statistical computing packages.

Prerequisites:

STAT 5166 and a linear algebra course, or consent of the instructor.

Course Grade:

Weights		Grading Scale	
Homework	30%	90-100	A
Midterm	30%	80-90	B
Course Project	30%	70-80	C
Project Presentation	10%	60-70	D
		Below 60	F

- **Classroom policies:**
  - You are **required** to attend all classes, Missing three or more classes without a good excuse will fail the course or get an incomplete. Please come to the class on time.

  Please be courteous to your classmates and instructor: 1) do not conduct private conversations during the class; 2) Cell-phones. ipad, laptops, and other electronic devices should be turned off during the class period and exams.

- **Homeworks:** Homework problems will be assigned biweekly. Homework must be neatly written, preferably typed. You can discuss with other students, but each student must independently write his/her own solutions. If there is more than one page, staple the pages together. In data analysis problems, turn in only those parts of the output which are most relevant for a final report. Tell in clear English the purpose of each step of the analysis, and tell what the plot or statistic shows.

University Policies

University Attendance Policy:

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy:

The Florida State University Academic Honor Policy outlines the Universitys expectations for the integrity of students academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to . . . be honest and truthful and . . . [to] strive for personal and institutional integrity at Florida State University. (Florida State University Academic Honor Policy, found at http://dof.fsu.edu/honorpolicy.htm.)

Americans With Disabilities Act:

Students with disabilities needing academic accommodation should:

(1) register with and provide documentation to the Student Disability Resource Center; and

(2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class.

This syllabus and other class materials are available in alternative format upon request.

For more information about services available to FSU students with disabilities, contact the:

Student Disability Resource Center

874 Traditions Way

108 Student Services Building

Florida State University

Tallahassee, FL 32306-4167

(850) 644-9566 (voice)

(850) 644-8504 (TDD)

sdrc@admin.fsu.edu

http://www.disabilitycenter.fsu.edu/

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Course Project:

A data analysis project is required for this course. You may find a data set by yourself or through online data libraries. Topics for the project might be on experimental design, analysis of variance, regression or others. The length of the project is expected to be 10-15 pages, including figures and tables. For the manuscript preparation of your project, Latex or Word is preferable. The written document should include:

- a clear and detailed description of the problem background and of the data associated with it.

- a precise statement of the substantive questions to be addressed by the analysis.

- a complete description of the methods used in the analysis.

- conclusions and discussion.

Please discuss the outline of your project with me before April 10. A final oral presentation of your project will be made in the final examination week. Each of you will be given about 10 minutes to present the main points of your project. The written document is due April 28th, Thursday of the final examination week.

Tentative Syllabus

Topic	Source	
Special Topics in Experimental Designs		Handout
Simple Linear Regression	Weisberg	Ch. 2
Multiple Regression	Weisberg	Ch. 3
Drawing Conclusions	Weisberg	Ch. 4
Weighted Least Squares, Testing for Lack of Fit	Weisberg	Ch. 5
Polynomials and Factors	Weisberg	Ch. 6
Transformations	Weisberg	Ch. 7
Regression Diagnostics: Residuals	Weisberg	Ch. 8
Outliers and Influence	Weisberg	Ch. 9
Variable Selection	Weisberg	Ch. 10
Nonlinear Regression	Weisberg	Ch. 11
Logistic Regression	Weisberg	Ch. 12