

Sociology 271C – Methods of Sociological Research: Applied Regression  
Spring 2014  
Tuesdays and Thursdays, 12noon-2pm, 402 Barrows Hall

Professor Samuel R. Lucas  
Office: 438 Barrows Hall  
Phone: 642-4765 or 642-4766  
E-mail address: lucas@demog.berkeley.edu  
home-page: <http://www.samuelroundfieldlucas.com>  
Office hours: Tuesdays 11am-noon and 2:30-3:30pm (**but check my web-site for updates**)

Linear multiple regression, aka regression, is both the over-stressed workhorse of multivariate analysis and the primary vehicle by which the basic logic of 21st century multivariate research can be conveyed. Our aim in this class is therefore two-fold.

First, we seek to understand regression analysis as a potentially useful tool. This will necessitate attending to the statistical assumptions of the model, diagnostic tests of those assumptions, possibly corrective interventions when assumptions are violated, and a critical appraisal of the statistical model in light of the various aims a researcher may have. Second, we seek to build our understanding of regression in a way that opens the door to understanding any of the other more complex methods that have been developed in the last quarter century, methods that increasingly dominate the published statistical analysis of social phenomena. This effort will take us *unto* but not *into* study of those approaches, providing sufficient grounding for the future study of those methods, or the critical evaluation of work based on those methods.

### **Reading, Assignments, and Grading**

You have been informed via e-mail how to obtain the text for this course, which is:

Kutner, Michael H., Christopher J. Nachtsheim, and John Neter. 2004. *Applied Linear Regression Models, fourth edition*. San Francisco, CA: McGraw-Hill/Irwin.

A slim volume that may come in handy in mid-October is the following little green sage book:

Namboodiri, Krishnan. 1984. *Matrix Algebra: An Introduction*. Beverly Hills: Sage Publications.

Two types of assignments have been devised to facilitate learning in the course—problem sets and examinations. Problem sets will generally be assigned weekly and will be due the following week. Late work (even late by a teensy-weensy bit) will not be accepted. Two mid-terms are scheduled, and a final exam is tentatively scheduled for one week after the last class.

Each problem set counts 5% (total=40%); each mid-term counts 15% (total=30%), and the final counts 25%. A participation grade counting 5%, and dependent on attendance and engagement, will also be allocated. No incompletes will be given in this class. Students are further advised to avoid making travel plans that may conflict with attendance, exams, or other requirements.

## Schedule of Readings and Assignments

### **Week 1, Jan 21-23 – Introduction and Linear Regression with One Predictor**

Reading: Reading: Kutner, Nachtsheim, and Neter (KNN) Appendix A & Chapter 1

Homework: Problem set exercises will be announced, due Jan 28

### **Week 2, Jan 28-30 – Inferences in Regression and Correlation**

Reading: KNN Chapter 2, sections 2.1-2.10

Homework: Problem set exercises will be announced, due Feb 4

### **Week 3, Feb 4-6 – Diagnostics and Remedial Measures**

Reading: KNN Chapter 3

Homework: Problem set exercises will be announced, due Feb 11

### **Week 4, Feb 11-13 – Simultaneous Inference and Regression Wrinkles**

Reading: KNN Chapter 4

### **Week 5, Feb 20 – Mid-Term Exam #1, covering material through Feb 6**

### **Week 6, Feb 27 – Matrix Algebra, Part I**

Reading: KNN, Chapter 5

Supplementary Resources:

Homework: Problem set exercises will be announced, due Mar 4

### **Week 7, Mar 4-6 – Matrix Algebra, Part II**

Reading: KNN, Chapter 5

Supplementary Resources:

Homework: Problem set exercises will be announced, due Mar 11

### **Week 8, Mar 11-13 – Multiple Regression Estimation and Inference**

Reading: KNN, Chapter 6 sections 6.1-6.6

Homework: Problem set exercises will be announced, due Mar 18

### **Week 9, Mar 18-20 – Multiple Regression Diagnostics and Summary Indices**

Reading: KNN, Chapter 6 sections 6.7-6.9 and Chapter 7 sections 7.1-7.4

Homework: Problem set exercises will be announced, due Apr 1

### **Week 10, Apr 1-3 – Multi-Collinearity and Functional Form**

Reading: KNN, Chapter 7 section 7.5, and Chapter 8 sections 8.1-8.5, 8.7

Homework: Problem set exercises will be announced, due Apr 8

### **Week 11, Apr 8-10 – Multiple Regression Model Assessment**

Reading: KNN, Chapters 9-10

### **Week 12, Apr 17 – Mid-Term Exam #2, covering material through Apr 3**

**Week 13, Apr 22-24 – Remedial Measures in Regression Analysis**

Reading: KNN, Chapter 11

**Week 14, Apr 29-May 1 – Generalized Linear Models**

Reading: KNN, Chapter 14

**Final Exam date – Thursday, May 8**