

SYLLABUS (Revised Feb 16, 2010)
Statistical Methods II
SURV 616, SURVMETH 686
Spring 2010

Instructor : Stephen M. Miller
Meeting Time : Fridays 12:30pm – 3:10pm,
1208 Lefrak Hall (Maryland), G300 Perry (Michigan)
email : smiller@survey.umd.edu
Class Website: www.jpsm.umd.edu/surv616
Teaching Assistants: (Michigan) Debanjana Datta, ddatta@umich.edu

Class notes: Provided on the class website

Texts : **An Introduction to Categorical Data Analysis (Second Edition)**
by Alan Agresti (2007), John Wiley (*Required*)

Recommendation(s): **The Little SAS book**, third edition
Lora D. Delwiche and Susan J. Slaughter

Homework : 30 % (6 @ 5% each)
2 Projects : 24 % (3 @ 8% each)
Final Class Project : 46 %

OVERVIEW

The purpose of the class is to build on the concepts discussed in Statistical Methods I, by introducing the student to five major groups of statistical methods : I. The General Linear Model, and Multivariate Analysis, II. Time Series Analysis, III. Categorical Data Analysis, IV. Statistical Methods in Epidemiology, and V. Analysis of Panel Data. The emphasis will be to understand and apply the methods presented, and develop a feel for how problems in data analysis can be viewed from several different perspectives. In all cases the emphasis will be on understanding the techniques, rather than deriving their theoretical properties. The student will be expected to apply the techniques on weekly homework problems, three projects, and a final project.

I. Multivariate Analysis

TOPICS: Overview of Data Analysis. Properties of the Multivariate Normal Distribution. Estimation of the Mean and Covariance Matrix. Inference about the Mean Vector and Covariance Matrix.

CLASS #1 (January 8, 2010) HW #1 (Due 1/15/10)

CLASS #2 (January 15, 2010) Project #1 (Due 1/29/10)

II. Time Series

TOPICS: Definition of Time Series data. Concepts of stationarity. Moving Average Series. Autoregressive Series. Estimation of Moments. Estimation of parameters. Prediction. Integration (differencing). Seasonal adjustment. Regression with time series errors.

CLASS #3 (January 22, 2010) HW #2 (Due 1/29/10)

CLASS #4 (January 29, 2010) HW #3 (Due 2/19/10)

Class Cancelled (February 5, 2010)

Class Cancelled (February 12, 2010)

CLASS #5 (February 19, 2010) Read NOTES#5, HW #4 (Due 2/26/10)

CLASS #6 (February 26, 2010) Read NOTES#6, Project #2 (Due 3/12/10)

III. Categorical Data Analysis

TOPICS: Basic distributions and sampling. Testing Binomial proportions. Two-way Table analysis, and chi-square tests for independence. Maximum likelihood methods. Log-linear models. Logistic regression methods.

Readings: **An Introduction to Categorical Data Analysis**, Chapters 1, 10, 2, 3, 6, 7, 5, (9)

NOTE: March 5th occurs during the Michigan Break. We will meet on March 5 at the University of Maryland and record the lecture for viewing by those students at Michigan.

CLASS #7 (March 5, 2010) Read NOTES#9

CLASS #8 (March 12, 2010) Read NOTES#10, HW #5 (Due 3/26/10)

NOTE: March 19th occurs during the Maryland Break. We will meet on March 19 at the University of Michigan and record the lecture for viewing by those students at Maryland.

CLASS #9 (March 19, 2010) Read NOTES#11, HW #6 (Due 4/2/10)

CLASS #10 (March 26, 2010) Read NOTES#12, Project #3 (Due 4/9/10)

NOTE: Submit a 1 page proposal by April 2, 2010 of what you plan to do for your Final Project. Be specific about the goals of the research and the data set(s) you intend to use. This proposal will not be graded, but it will be returned with comments and approval or disapproval of the proposal will be given.

IV. Statistical Methods in Epidemiology

TOPICS: Nature of Epidemiological analysis (Demographic, Epidemiological). Nature of Epidemiological data (Experimental, Observational). Concepts of Mortality, and Morbidity. Incidence rates, and Prevalence rates. Relative risk, and Odds ratio. Life table analysis, and Survival analysis (Kaplan Meyer estimator). Cox proportional hazards regression.

CLASS #11 (April 2, 2010) Read NOTES#13

CLASS #12 (April 9, 2010) Read NOTES#14

V. Analysis of Panel Data

TOPICS: Introduction to pooling time series and cross-sectional data. Regression with time series data. Taxonomy of models for panel data with fixed and random components. Estimation.

CLASS #13 (April 16, 2010) Read NOTES#7

CLASS #14 (April 23, 2010) Read NOTES#8

GRADING

Each assignment will be will receive a numerical score, which corresponds to the following letter grades:

A+	[98,100]
A	[93,98)
A-	[90,93)
B+	[87,90)
B	[83,87)
B-	[80,83)
C+	[77,80)
C	[73,77)
C-	[70,73)
D+	[67,70)
D	[63,67)
D-	[60,63)
F	[50,60)

Assignments which are turned in late will lose points. The final course grade is determined by assigning the letter grade corresponding to the result of the weighted average of the numerical scores for each of the assignments (30% total for the Homeworks, 24% total for the three Projects, and 46% for the Final Class Project).