MONTEREY INSTITUTE OF INTERNATIONAL STUDIES
GRADUATE SCHOOL OF INTERNATIONAL POLICY STUDIES

IP673 Advanced Data Analysis

SYLLABUS - FALL 2005

FERNANDO DE PAOLIS (fernando.de.paolis@miis.edu)

FORMAT

Lecture: Wednesday 8:00-9:50 -- Morse B209

Office Hours: Tuesday - Thursday 2:30-4:30 PM. 116 McCone. (Also by appointment)

Virtual Classroom: Visit http://faculty.miis.edu/~fdepaolis/teaching.htm for changes and additions regarding syllabus, homework, datasets, and assignments. Also, check daily the course conference on First Class. Once the information has been published, I will assume that you are aware of the changes or additions. Check both sources regularly.

DESCRIPTION

This course covers a set of more sophisticated statistical tools, and is intended to be a continuation of the Data Analysis course regularly offered in the Spring semester. The main modules are Factor Analysis, Non-Linear Regression, and Time Series Analysis. It is structured as an "applied" course with a strong emphasis on policy analysis applications, and designed around once-a-week lectures. Multiple data sets will be used, but students are encouraged to use their own data and background knowledge.

TEXTBOOKS & OTHER MATERIAL

Required:

- Course Reader.
- Additional readings will be distributed in class or electronically.

Other Sources:

- Agresti and Finlay (1997) *Statistical Methods for the Social Sciences*.

METHODOLOGY AND POLICIES

METHODOLOGY

The course is developed as a series of twice-a-week lectures and class discussions. The lectures loosely follow the book chapters in the reader and other material, some of which is indicated in the list of suggested textbooks. Some of the books will be available at the MIIS library (reserve desk), and/or will be distributed electronically. You are encouraged to find on-line tutorials that might suit your reading style.
The seminar design requires a **substantial participation** by students. Therefore, students are expected to read the material assigned and be prepared to ask and to answer questions during class.

WORK SUBMISSION

Homework is due by 5:00 p.m. of the date specified. It will be returned one week from that date. Homework which is submitted late, but before the week is over will be marked down a grade. Late homework must be submitted before the graded homework is returned. Late submission of the final paper is not allowed.

ACADEMIC CONDUCT

Students are responsible for abiding the rules in the Academic Policy and Standards Manual (APSM). The most serious academic offense in this course is plagiarism, as defined in APSM. I treat this issue very, very seriously. Assignments in which students failed to cite source in the proper fashion will receive a failing "F" grade. I reserve the right to submit any of your work (including drafts and informal pieces) to plagiarism search engines and sites. **No replacement assignment will be given in lieu of the failed assignment.** Students who, through action or omission, facilitate the commission of plagiarism are violating academic integrity. This behavior is unacceptable in all cases (written assignment, in-class tests, etc.) and will be severely penalized.

REQUIREMENTS AND GRADING

Preparation and Class Participation	15%
Assignments	35%
Final Paper including presentations	50%
Total	100%

LETTER GRADE SCALE

Letter grades are derived from natural breaks in numeric grades. Most of the time, "numeric" grades are rounded upward when calculating the "letter" grade.

SCHEDULE AND WEEKLY READINGS

Week 1 August 31
Introduction and Class Plan

Week 2 September 7
Factor Analysis
The concept of SEM (structural equation modeling). Latent variables and factors. Other data reduction techniques. Definition of factor analysis and types.
Readings:.

Week 3 September 14
Factor Analysis (cont.)
Types of factoring and basic assumptions. Factor components. Eigenvalues. Factor loading. Rotations
Readings:

Week 4 September 21
Factor Analysis (cont.)
Using SPSS and Excel. Factor interpretation. Scree plots.
Readings:.

Week 5 September 28
Non-linear Regression Models
Review of main concepts of regression. Introduction to probabilities. Probability distribution. Binomial random variables.

Week 6 October 5
Non-linear Regression Models (cont.)
Dichotomous dependent variables. Odds; odds ratio; logit. Concepts and assumptions
Readings:

Week 7 October 12
Non-linear Regression Models (cont.)
Readings:

Week 8 October 19
Non-linear Regression Models (cont.)
Readings:

Week 9 October 26
Time Series
Introduction. Main concepts and definitions. Curve fitting.
Readings:

Week 10 November 2
Time Series (cont.)
Simple and composite indexes. Smoothing and extrapolation
Readings:.

Week 11 November 9
Time Series (cont.)
Properties. Stochastic time series models. Characterization and autocorrelation. Random walks.
Readings:

Week 12 November 16
Time Series (cont.)
Linear time series and forecasting. Moving average (MA) models. Autoregressive models (AR). Mixed ARMA models. Integrated homogeneous models (ARIMA)
Readings:

Week 13 November 23
Time Series (cont.)
Readings:

Week 14 November 30
Path Analysis

Week 15 December 7
Path Analysis (cont.)

FINAL PAPER DUE FRIDAY, DECEMBER 9 @ NOON