

Department of Geography
UNIVERSITY OF FLORIDA, SPRING 2005
Geography 4167c/6938 Section 6647Z
Intermediate Quantitative Methods
Instructor: Dr. Timothy J. Fik, Associate Professor
Prerequisite: GEO 3162 or equivalent statistics course
Time: Tuesday (T) -- Periods 7-9 (1:55PM to 4:55PM)
Location: TUR 3012

Office: 3137 Turlington Hall
Office Hours: Monday and Tuesday: 9:00-11:45AM
or by appointment (392-0494)

Overview

This course surveys various univariate, bivariate, and multivariate statistical techniques that are commonly used in the spatial and social sciences. Lectures will focus on linear and non-linear models and extensions. The course emphasis is on the use of **regression analysis** for cross-sectional, qualitative, time-series, and geo-coded data. Selected topics include (yet are not limited to) the following:

Least Squares Methods & Regression Analysis
Multiple Regression -- methods, interpretation, diagnostics, remedial measures
Regression Analysis (a Matrix Algebra approach)
Spatial Autocorrelation Measures (Local vs. Global Indicators)
The Use of Dummy and Interactive Variables
Trend-Surface Models & Interpolation
Spatial Auto-Regressive Models
Geographically Weighted Regression
Spatial Econometric Methods
Basic Time-Series Analysis
Model Specification Issues
Logistic Regression
Principal Components Regression
Data Transformation & Questions of Functional Form

Course Objectives are two-fold: (1) familiarize the student with procedures, statistics, diagnostics, and remedial measures commonly used in regression modeling and multivariate analysis; and (2) allow students to gain hands-on experience in applied quantitative methods and modeling through various take-home lab assignments and the completion of a final term project.

Recommended Reading Materials

Selected chapters and sections from the following:

Statistical Methods for Geography, by P. Rogerson (2001); Sage Publications.

Multiple Regression in Practice, by Berry & Feldman, Quantitative Applications in the Social Sciences #50, Sage Publications.

Time-Series Analysis: Regression Techniques, Ostrom, Quantitative Applications in the Social Sciences #9, Sage Publications.

Note: Supplemental reading material may be distributed at times throughout the semester.

Course Components

There are 5 lab assignments (worth 10 points each) and a final term project (worth 50 points)... for a total of 100 points.

Grading Scale: 90-100 points = A; 87-89 = B+; 80-86 = B; 77-79 = C+; 70-76 = C; etc.

Note: Penalty for "late" labs (after due date) = -2 points per day

Due Dates for Labs: TBA

Term Project: Applied Regression Analysis

The term project must demonstrate a working knowledge of regression in an application involving spatial and/or temporal data to address a specific research problem that the student is interested in investigating. The project must incorporate various techniques or methods discussed in lecture. Research topics must be approved by the instructor (no later than the end of the 1st week of classes during the month of March).

Students are responsible for generating and analyzing their own data, interpreting the results, and writing and submitting a final report (not to exceed 25 pages in length).

Term Project Due Date: TBA

Penalty for late projects = -10 points per day.

Spring 2005

Term Project Guidelines

Note: The term project is worth 50 points and 50% of your grade for this class.

Requirements

Your project should demonstrate a working knowledge of “regression analysis”, applicable diagnostic procedures, and/or remedial measures. You are required to apply regression to describe, explain, predict, or model a phenomenon of interest (i.e., to account for variation in a dependent variable). This must include a write-up of the results, including an overview of the model and methods used.

The regression model should be multivariate and include a minimum of at least two independent variables. All relevant graphs, plots, charts, and statistical summary tables should be submitted along with a summary and write-up (not to exceed 25 pages in length). Attach statistical output as an appendix.

The write-up must be typed, double-spaced (using standard fonts, line spacing, and margins), with a minimum of 15 pages of text. The project should have a cover/title page clearly showing the student’s name and the title of the work. The write-up should include the following:

- overview or statement of the problem
- brief literature review and background information
- clearly defined hypotheses
- description of the model, variables, and functional form
- theoretical justification of model
- general description of the data used in the analysis
- summary table(s) highlighting the results
- interpretation of results and discussion of the findings
- conclusions and implications
- directions for future research and final remarks
- statistical appendix (output)
- literature cited page or bibliography

Term projects will not be accepted on computer disk, nor may projects be submitted via e-mail or by FAX. Note: The cover/title page, statistical appendix, and bibliography do not count as pages of text. In addition, the write-up must be page-numbered and securely stapled or bound together (do not use paper clips or turn in loose pages).

Due date: Term projects are to be handed in on or by the due date (TBA) by 4:00PM. Projects may be handed over to instructor or turned in at the Geography Department’s main office (3141 Turlington Hall). No late projects will be accepted for any reason. There are no exceptions.

Failure to turn in a term project by the due date will result in a grade of E for the course.