Term: Spring, 2012
Instructor: Michael J. Brondino
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Office Hours: Monday 10-Noon and by apt.
Time and location: Friday 9:30-12:15pm, Enderis 110

Course Description: This one semester course will focus on regression techniques commonly used in social science research. These will include, but may not be limited to: simple and multiple ordinary least squares regression, binary, ordinal and multinomial (polytomous) logistic and exact logistic regression, Poisson and the negative binomial model. We will also briefly discuss extensions of these procedures to models involving more than a single dependent variable, e.g., path analysis. Other regression-based topics may be covered as time permits. The course content will be presented in lecture format and through assigned readings. Weekly computer assignments will require analyses to be run in SAS and SPSS to ensure that the students understand the proper implementation of the techniques in both software packages.

Prerequisites: Graduate standing or the written consent of the instructor.

Course Objectives: On completion of this course, the students will be able to:

1. Correctly apply regression-based techniques to analyze data under a variety of error models
2. Apply and interpret the results of regression diagnostic procedures
3. Interpret the meaning of coefficients from different coding schemes, properly interpret interaction effects, and address issues such as the scaling of predictors in logistic regression
4. Understand the effects of measurement error, multicollinearity, suppressor variables, and misspecified models on parameter estimation and significance tests
5. Interpret the output from SAS and SPSS regression procedures
6. Understand extensions of the logistic regression model to address issues in behavioral research, e.g., mediator variable analysis, propensity score adjustments and ROC analysis

Texts / Readings


Copies of the lecture notes will be available on the D2L system and can be printed out prior to lecture to facilitate note taking.

Other Sources you may find useful in relation to the topics covered in this course:


Course Policies

Campus policy information regarding participation by students with disabilities, accommodations for religious observances, academic conduct/misconduct, incomplete grading policies, complaint procedures, grade appeal procedures, sexual harassment and safety policies, final exam date requirements, and other standing policies/procedures is available on-line at: http://www.uwm.edu/Dept/SecU/SyllabusLinks.pdf.

Academic Misconduct: Academic misconduct is an act in which a student seeks to claim credit for the work or efforts of another without authorization or citation, uses unauthorized materials or fabricated data in any academic exercise, forges or falsifies academic documents or records, intentionally impedes or damages the academic work of others, engages in conduct aimed at making false representation of a student's academic performance, or assists other students in any of these acts. Prohibited conduct includes cheating on an examination; collaborating with others in work to be presented, contrary to the stated rules of the course; submitting a paper or assignment as one's own work when a part or all of the paper or assignment is the work of another; submitting a paper or assignment that contains ideas or research of others without appropriately identifying the sources of those ideas; stealing examinations or course materials; submitting, if contrary to the rules of a course, work previously presented in another course; tampering with the laboratory experiment or computer program of another student; knowingly and intentionally assisting another student in any of the above, including assistance in an arrangement whereby any work, classroom performance, examination or other activity is submitted or performed by a person other than the student under whose name the work is submitted or performed.

Students' work must be in their own words except where appropriately cited. Excerpts from other authors may be used judiciously, but direct quotes involving even a few words must include the source, date, and page number(s) and must be indented or enclosed in quotations. Failure to comply with these requirements constitutes plagiarism and is grounds for a failing grade.

Late assignments and make-up policy: Students are expected to be present for examinations and to turn in assignments on or before the due date unless they contact the instructor in advance of the exam or due date. If an extension is given for a particular assignment, the grade may be reduced at the discretion of the instructor. Alternatives such as make-up exams or substitute assignments may then be made available at the instructor’s discretion, but these will only be offered as a result of circumstances beyond the student's control. Failure to comply with the above requirements will result in a grade of zero for the relevant assignment.

Attendance and class participation: Because the material will be covered at a rapid pace, attendance is mandatory for all lectures and labs unless prior arrangements have been made with the instructor. Students with unexcused absences will receive a one-third reduction in their final grade for each unexcused absence (e.g., a final grade of A will be reduced to an A- following one unexcused absence).

Participation by Students with Disabilities: If you need special accommodations in order to meet any of the requirements of this course, please contact me and the StudentAccessibilityCenter as soon as possible to make the necessary arrangements.

Accommodation for Religious Observances: Students will be allowed to complete examinations or other requirements in advance of a religious observance.

Assignments/Grading
Weekly assignments: Students will be assigned weekly homework problems for the lecture portion of the course. Each assignment will be worth 20 points and together will count for 20% of your total grade.

Exams: Three (3) exams covering the lecture material will be given over the course of the semester. Exams each count 23% for a total of 69% toward your final grade.

Project: Each student is required to work with a faculty member in their area of interest to locate a data set, propose and test an hypothesis of interest and prepare a report on the project to be turned in at the last class meeting prior to exam week. This project will count for 11% of your final grade. Guidelines for the project will be handed out in class.

**Determination of Student Grade**

Letter grades will not be assigned on individual assignments or exams. Rather, each assignment and exam will be allotted a specific number of points. Points earned will be summed into a final point total and letter grades assigned based on these final point totals by the percents listed below.

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<thead>
<tr>
<th>Points</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>94 – 100%</td>
<td>A</td>
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<tr>
<td>90 – 93%</td>
<td>B</td>
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<tr>
<td>87 – 89%</td>
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<td>79 – 77%</td>
<td>C</td>
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<td>0 – 59%</td>
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**Topics**

Note that this schedule is only approximate. While we will cover the material in the order presented, the actual amount of time devoted to any topic may vary in any given semester.

**Week 1: Introduction and overview, review of bivariate correlation and simple OLS regression.**

Readings: Chapters 1 and 2 Cohen et al.
Assignments:
- Computer - Run simple regression in SAS and SPSS, label output, summarize results.
- Written - Problems available on D2L

**Week 2: Multiple regression with two or more independent variables.**

Reading: Chapter 3 Cohen et al.
Assignments:
- Computer - Run multiple regression in SAS and SPSS, label output, summarize results.
- Written - Problems available on D2L

**Week 3: Regression diagnostics, data visualization, begin matrix algebra.**

Reading: Chapter 4 Cohen et al.
Assignment: Computer - SAS and SPSS Diagnose problems with data set provided on D2L, summarize results.

**Exam I**

**Week 4: Matrix algebra and the mathematical basis of regression (GLM and GLMs) cont.**
Readings: Appendixes 1 and 2 Cohen et al., Matrix algebra handouts on D2L
Assignment:
   Computer - SAS IML regression analysis

**Week 5: Data analytic strategies using multiple regression including hierarchical regression; variable selection methods such as forward, backward and stepwise, significance testing and power analysis for sets of variables, etc.**

Reading: Chapter 5 Cohen et al.
Assignment:
   Computer - Run variable selection analyses on same data set, compare and summarize results in SAS and SPSS.

**Weeks 6-7: Trend analysis, interpreting interactions, centering, simple regression equations.**

Reading: Chapter 6 Cohen et al.
Assignment:
   Computer - Run trend analysis in SAS or SPSS, interpret output, summarize results.

Reading: Chapter 7 Cohen et al.
Assignment:
   Computer - Run interaction analysis in SAS or SPSS, interpret output, summarize results.

**Exam II**

**Weeks 8-9: Categorical predictors, dummy, effect, contrast coding, Interactions with categorical variables**

Reading: Chapter 8 Cohen et al.
Assignments:
   Computer - Run analyses involving coded categorical predictors, interpret output, summarize results in SAS or SPSS.
   Written - Problems available on D2L

Reading: Chapter 9 Cohen et al.
Assignments:
   Computer - Run interaction analysis in SAS or SPSS, interpret output, summarize results.

**Week 10: Outliers, multicollinearity, and handling of missing data**

Readings: Chapters 10 and 11 Cohen et al.
Assignments:
   Computer - Diagnose data set in SAS and SPSS, address missing data issues using SAS, summarize results

**Exam III**

**Weeks 11-14: Binary, Poisson, and Negative Binomial regression**

Readings: Chapter 13 Cohen et al.
Handouts on D2L
Assignments:
   Computer - Run logistic and Poisson regression analyses in SAS and SPSS, interpret and label output, summarize results
   Written - Problems available on D2L
Week 15: Models with multiple dependent variables; path analysis

   Reading: Chapter 12 Cohen et al.
   Handouts on D2L
   Assignments:
      Computer - Run path analysis using multiple regression approach in SAS or SPSS,
                summarize results, run simple model in LISREL

Exam IV

Additional topics as time permits: multinomial and exact logistic regression

Project due in last class prior to exam week

Finals Week: Cumulative Final examination