Course Description and Outline

This course will cover methods for models that have dependent variables that are not continuous. These models include dichotomous and polychotomous response models, models for censored and truncated data, sample selection models, duration models and models for count data.

Prerequisites: Students wishing to take this course should have taken an introductory course in probability, a course on regression analysis, and have basic knowledge of calculus and matrix algebra.

Course Requirements: The grading for the course is based on a mid-term and final exam (20% and 30%, respectively), homework assignments (20%), and a final project (30%). The project will consist of a 10 to 15 page paper on a topic of the students’ choosing. Students will use their own data sets for some of the homework assignments and the project. I have set up a web site that contains numerous links where students can find appropriate data (the URL is http://www.columbia.edu/~gjw10/g4291.html).

Lecture Notes: PDF versions of my lecture notes are available from the course web site. Students should download and print up a copy of the notes for themselves so that they can follow along with the lectures. Students who do not have a copy of the notes will be at a severe disadvantage.

Texts: I have ordered several books for this course through Labyrinth. Although all of these books are useful and are strongly recommended, only the following two are required purchases:


Students will be assigned readings from these two texts. Although the material assigned from these two texts overlaps, students should read assignments from both in order to get the most out of the material. The Maddala reading is somewhat more difficult and dated, but will give students a more advanced treatment of the material. The other texts will serve as supplementary reading.
All reading assignments from books are on reserve at Lehman. All reading assignments from journals are available through JSTOR (http://www.jstor.org/).

**Computing/Software:** The statistical software package of choice for the assignments is GAUSS. Students are welcome to use any software package they are familiar with, but we will provide support only for GAUSS and some assignments will require writing GAUSS code. GAUSS is available on the ISERP computing network. After the registration period, you will be set up with an account on the network if you do not have one already.

**Course Outline**

I have not included any dates on the syllabus to allow for maximum flexibility in the progress of the course. I will announce in class what readings students should do each week.

I **Introduction**

1 **Course Motivation**
   - Long, Chs. 1 and 2.
   - Maddala, Ch. 1.

2 **Review of Fundamentals of Probability**

II **Maximum Likelihood Estimation**


III **Models derived from a common structure: the normal regression model**

5 **Introduction**
   - Long, Ch. 2.

6 **Probit**
   - Long, Ch. 3.
   - Maddala, Ch. 2.1–2.5.
7 Ordered Probit
   • Long, Ch. 5.

8 Censored Regression
   • Long, Ch. 7.
   • Maddala, 6.1–6.6.

9 Truncated Regression
   • Maddala, Ch. 6.9–6.10.

10 Sample Selection Models
   • Maddala, Ch. 9.

IV Probabilistic Choice Models

11 Introduction
   • Review Long, Ch. 3 for binary logit.

12 The Multinomial Logit Model
   • Long, Ch. 6.
   • Maddala, Ch. 2.10–2.12, Ch. 3.

13 The Conditional Logit Model
   • Long, Ch. 6.
   • Maddala, Ch. 3.

14 The Nested Logit Model
   • Greene, pp. 865–870.
   • Maddala, pp. 67–70.

15 The Multinomial Probit Model
   • Greene, pp. 870–875.
V Duration Models


VI Event Count Models

- Long, Ch. 8.

VII Models for Repeated Observations