I. GENERAL: The course will cover a number of important maximum likelihood models: Simulation-based methods (mainly from CT, defined below); qualitative and limited dependent variables with cross-section data, and panel data with discrete response, censoring, and sample selection (mainly from W, defined below); failure-time models; and count data models. The last two topics will be covered briefly due to time constraints. However the more-extensive coverage in CT is excellent and highly recommended.

1. Grades: There will be 3 projects in the course and a final. The grade will be derived as follows: 40% projects and 60% final. Habitually, one or two students do very well answering questions that I ask in class and figuring problems out on the spot, but do poorly on the exams. Class participation can add up to 10 extra points to your final grade. You will not receive a deduction for not participating.

2. Projects: Each day or fraction thereof a project is late beyond the date due results in a one grade reduction. There are no exceptions other than illness. While you can work jointly on understanding the projects, all code for the projects must be unique to the individual. Do not turn in the same code as someone else in the class or someone who has taken the class previously. You must write the code yourself using unique variable names and comment statements. Otherwise, zero credit will be given. ALL PROJECTS MUST BE DONE USING TSP. NO EXCEPTIONS.

3. Attendance: Do not come late to class. More than two or three minutes late after class begins counts as an absence. You have two free absences from class. For each additional absence without a doctor’s excuse, I will deduct one-half of a letter grade from your final grade. If I deem that your absences are cronic, I will drop you from the class without warning; this could occur at any time during the semester.

II. OFFICE HOURS: 503 Brooks Hall, T/Th 3:30-5:00 and by appt. All projects and related materials are on the course web site found by going to Terry College → Economics → Atkinson → 8120.

III. PRINCIPLE TEXTS:


3. TSP 5.0 User’s Guide and Reference Manual. All projects must be done in TSP.
IV. OTHER GOOD REFERENCE TEXTS:


V. COMMENTARY ON REFERENCE TEXTS: The Davidson and MacKinnon text is a good up-to-date text. Amemiya's *Intro* text is very good but terse. The problems are excellent. Amemiya's JEL review article, Maddala’s text, and the Wooldridge text (the latter of which are required for course) are excellent for limited dependent and qualitative variables. Also ch. 20 & 21 in Greene are good. The text by Judge (1988) is not as exhaustive as Judge (1985) but is more readable. The Fomby-Hill-Johnson text is similar. Chow's text is also good for special topics. The texts by Pindyck and Rubinfeld and by Kmenta are good for a simpler treatment of many topics. Goldfeld and Quandt is excellent for non-linear models and algorithms. Johnston is very good for a matrix algebra review. Hsiao's book on panel data is also very good. Read the TSP manual for a good presentation of most of the algorithms that they use. The Myoung-jae Lee book (1996) is very good for a method of moments treatment of the standard linear model and limited dependent variable models plus semiparametric estimation. The Horowitz text is good but technical for non-parametrics. Rudd’s text is useful for a reference, but highly technical and difficult. The Myoung-jae Lee book (2002) is very good for panel data treatments and is a useful supplement to Wooldridge. Hayashi (2000) and Wooldridge rate as clearly the best textbooks. While Hayashi is much more involved with time series econometrics, try to read both on relevant topics. The Train (2002) text is excellent on numerical methods and discrete choice modelling.

VI. PREREQUISITES

1. Econometrics – 8070 and 8080.

2. You should also know calculus, matrix algebra, and mathematical statistics through material covered in a good math stat text.

VII. COURSE OUTLINE (subject to change)

<table>
<thead>
<tr>
<th>Week</th>
<th>Starts</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1-5</td>
<td>8/18 (Monday)</td>
<td>TOPIC #1: SIMULATION-BASED METHODS</td>
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TOPIC #2: QUALITATIVE AND LIMITED DEPENDENT VARIABLES

Includes logit, probit, tobit, censoring, truncation, and ordered probit

W, Ch. 15-16
CT, Ch. 14-15

Train (2002):
- GEV models: pp. 87-106

G.S. Maddala, "Disequilibrium, Self-Selection, and Switching Models," *Handbook of Econometrics*, III, Ch. 28

D. L. McFadden, "Econometric Analysis of Qualitative Response Models," *Handbook of Econometrics*, II, Ch. 24

For applications of many of these methods, see Manski, C. F. and D. McFadden, *Structural Analysis of Discrete Data*, Cambridge, Mass: MIT Press, 1981

For a Gibbs Sampling approach to estimating the multinomial probit see:

For a Monte Carlo analysis of MLE estimators of qualitative and limited dependent variables in the presence of fixed effects see:

W, chs. 17-19


Computing Estimated Standard Errors
1) The delta method
2) As an alternative to the delta method:
3) Correcting 2-step estimated standard errors:

PROJECT #1 DUE

10/31–FALL BREAK (Th-F)

11-14

TOPIC #3: SAMPLE SELECTION, ATTRITION, QUALITATIVE PANEL DATA  
W, Ch. 17  
CT, Ch. 16

PROJECT #2 DUE

15

TOPIC #4: COUNT DATA,  
11/24-11/28–THANKSGIVING BREAK  
W, ch. 19  
CT, ch. 20

16-17

TOPIC #5: TRANSITION DATA: SURVIVAL ANALYSIS  
W, ch. 20  
CT, ch. 17-19

Lawless, 272-343.  

PROJECT #3 DUE

12/4

LAST DAY OF CLASSES

12/11

FINAL EXAM (TH) 12:00-3:00