**HPM 883**

ANALYSIS OF CATEGORICAL DATA

(Credit Hours: 3)

*Department of Health Policy and Management*

School of Public Health

Spring 2017 Syllabus

Class Location: McGavran-Greenberg 1304

Meeting Times: MW 11:15-1:10**

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**Faculty:** Marisa E. Domino, Ph.D.

**Office:** 1104 G McGavran-Greenberg

**TA:** Karen Swietek

**Problem session M/W 12:30-1:10pm Rosenau 235**

**Office Hours:** TBD

**Problem session:** (McGavran-Greenberg 1106G)

**Email:** domino@unc.edu

**Phone:** 966-3891

**Office Hours:** TBD

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**Course Overview**

This course is an introduction to the analysis of categorical data using generalized linear models and maximum likelihood estimation (MLE). We will study statistical models in which the dependent variable is not continuous, including logit and probit, multinomial logit, ordered logit and probit, tobit, two-part, and count models. This course examines how to choose the appropriate model, check the model specification, and interpret and present the results. We will use Stata software in the course for examples and assignments.

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**Learning Objectives and HPM Competencies**

<table>
<thead>
<tr>
<th>Course Learning Objective</th>
<th>Competencies</th>
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<tbody>
<tr>
<td>1 To estimate and interpret logit, probit, and other categorical data models</td>
<td>Analytical Thinking</td>
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<tr>
<td>2 To build appropriate models in an Maximum Likelihood, GLM or GEE framework</td>
<td>Analytical Thinking</td>
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<tr>
<td>3 To conduct and interpret specification tests</td>
<td>Analytical Thinking</td>
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<tr>
<td>4 To conduct original research using MLE, including being able to describe a data set,</td>
<td>Communication Skills</td>
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HPM 883

Spring 2017

Prof. Marisa Domino

Last updated: December 20, 2016

UNC-Chapel Hill
application of an MLE model, and the coherent, concise description of the results

Resources

Website

HPM 883 has its own website using Sakai software. (See http://sakai.unc.edu.) This syllabus is on the website.

Be sure to check that the email address Sakai has for you is correct. Click on the “My Workspace” tab in Sakai and then click on “Profile.” If you need to change your email address, click on “Edit” under “Contact Information” and follow the directions. Note that you may need to change your email address in both Sakai and the On-Line Campus Directory.

Text

The course text is Microeconometrics Using Stata, Revised Edition by A. Colin Cameron and Pravin K. Trivedi (2010). This text and this course focus on applications of maximum likelihood techniques and therefore do not incorporate a rigorous theoretical presentation. I urge you to have as a reference an advanced econometrics or statistics book. Some possibilities are:


For most units, a Unit Guide will be posted on Sakai. This guide will give you tips about the required reading, in terms of which sections to focus on, which to skip, and notes about particularly challenging sections.

Additional readings from recent journal articles will be required for the course. I will provide you the citation for these readings and whenever possible will use readings available electronically through the UNC library.

As with previous HPM Methods courses (881-882), students should make sure they have access to the most recent copy of Stata. Manuals are available on line.

- StataCorp. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP.
Stata 11-13 may be acceptable alternatives, although there are a few commands we will use that only appeared in Stata 14. Versions of Stata prior to Stata 11 do not use the same commands for calculating marginal effects and thus are not sufficient for this course. The virtual lab has Stata available for free to university affiliates but many students complain that this is not a reliable option, especially when accessing it from off-campus.

**Web Sources**

Among the many useful websites is that of the Medical Expenditure Panel Survey (MEPS) which may be used for class activities, assignments, and exams. This data is available for free from the Agency for Healthcare Research and Quality (AHRQ) through their web site (www.meps.ahrq.gov). The MEPS is a very comprehensive (and complicated) dataset which may be useful to students as they write papers even beyond this class. Because 881 is a pre-requisite for 883, I will assume students in 883 are familiar with the MEPS data.

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**Requirements and Expectations**

**Prerequisites:**

HPM 881 and HPM 882 or equivalent graduate level courses are pre-requisites to HPM 883. It is the student’s responsibility to know the material from HPM881-882 if other acceptable pre-requisites have been taken. Students who have not taken HPM 881 and 882 must get the instructor’s permission to continue in 883. Students must also have a solid foundation in Stata to take this course.

**Weekly Assignments:**

Readings should generally be completed **before** the class for which they are assigned.

- Unless otherwise indicated, assignments for the class are due on Wednesdays by the beginning of class. Assignments can be uploaded on Sakai but paper versions will also be accepted.

I reserve the right to select only a subset of questions from each problem set for grading. Questions on weekly assignments will be graded on a two-point scale:

- 2 = perfect answer
- 0 = incorrect or mostly incorrect
- 1 = somewhere in between

The lowest score on a problem set (aside from the peer review) will be dropped from grading.

**Late Assignment Policy**

Assignments and papers are due at the beginning of class on the relevant date. Late assignments will not be accepted, except in extreme circumstances with the approval of the instructor.

**Course Format**

This is primarily a lecture-based course. We will have occasional team-based exercises that will be
conducted during the class period. Teams will be formed on the first day of class. Team assignments may be both critical, in terms of analyzing manuscripts, and constructive, in terms of developing estimates. Some team assignments may build on homework questions. Both team assignments and individual homework assignments are intended to give students further practice applying the course materials and experience working in a research team. Team participation will be evaluated by other team members and will constitute a small fraction of the final grade.

Weekly Problem Sessions

There will be a weekly problem session in which the teaching assistant will go over the assignments turned in during the prior week. This time will also be used for tutorials on topics that may need extra attention. Students who scored lower than 80% on the prior HW assignment as well as those who could benefit from extra review should plan to attend the problem sessions. All students should be available during the problem session time, since it is during scheduled hours for this course. This time slot may be used to make up any canceled classes due to weather events.

Evaluation Methods

Grade Components

The course grade will be a weighted average of performance in four areas: homework assignments, a midterm exam, a final exam, and an empirical paper. Homework assignments will include a mix of written problems and computer assignments. The empirical paper allows the students to demonstrate the skills learned throughout the semester. Students should start looking now for an interesting empirical question to answer and a data set that can be used to answer that question (the MEPS is strongly encouraged for this purpose). In addition, there will be a randomly assigned blind peer review of one of your colleague’s empirical papers, which will carry the same weight as a homework assignment.

Grading:  
Homework Assignments  20%  
Midterm exam  22.5%  
Final exam  22.5%  
Empirical paper  30%  
Team Assignments  5%  

Final grades:  H 90% or higher  
P 70-90%  
L 60-70%  
F <60%  

1. Exams

This course will have a midterm and a final exam, both of which will be taken individually (not in teams). The midterm will be scheduled during class time before spring break. The final exam will be cumulative. The final will occur during the scheduled time on the University’s final exam schedule. Please make sure you know the dates of these exams; alternate dates will only be scheduled in cases of serious illness.

2. Homework problems
Homework assignments will be required for each unit of the course. Answers to homework problems will be reviewed in the corresponding problem sessions and will not be posted.

Homework assignments should be submitted in Word format if at all possible, to facilitate comments by the TA and instructor. Sections of the Stata log should be included for many of the applied questions. Because Stata output is easiest to read in proportional fonts (such as Courier New), cut and paste from the stata log into a Word document, then highlight the pasted section and change the font to Courier New (8 point may help shrink to fit to the word page limits, but decreasing the margins in Word to 0.5” may also help). Turning in the Stata do file is usually not appropriate as it does not provide the output or sufficient detail to answer most of the homework questions.

3. Empirical paper

Each student will write an empirical paper that will use at least one of the maximum likelihood techniques learned during the semester. Students should start looking now for an interesting empirical question to answer and a data set that can be used to answer that question (the MEPS is strongly encouraged for this purpose, but other data sources are allowed). Students have the responsibility to ensure that their paper and data are covered by the IRB. Further detail is provided below.

Each student is required to prepare a description of their proposed paper topic prior to spring break. Each paper proposal should consist of a short document, which provides information on (1) the paper title and research question; (2) the conceptual model (briefly); (3) the data and sample to be used; (4) the dependent variable and type of model to be estimated; (5) the key independent variable and other important control variables. The paper proposal will account for 5% of the paper grade. Paper proposals submitted after the paper proposal deadline may not receive full credit.

After papers are completed, each student will be a randomly assigned blind peer review of one of your colleague’s empirical papers. This peer review will be given the same weight as an individual readiness assessment.

4. Team Assignments

Team assignments are designed to provide an opportunity for students to practice the skills they have learned in the readings. Team assignments are intended to be completed during class; teams are not expected to meet outside of class time.

Team Assignments will include a mix of written problems and computer assignments. Most team assignments will require minimal write-up by team members. The results of team assignments will be discussed in class and many activities will ask teams to comment on the results of other teams’ work. To the extent that team assignments are not completed in a single class session, team members should not discuss assignment with members of other teams outside of class.

Cell Phones and Laptops

Turn off cell phones in class. Laptops may be used in class and for team assignments but not during exams. Please be considerate when using laptops, typing can be quite noisy and distracting to others in the classroom.
**Ethics Certification and IRB approval**

Your paper for this course *may* require IRB review. Please read the IRB document on Student papers carefully: [http://research.unc.edu/files/2012/11/ccm3_036121.doc](http://research.unc.edu/files/2012/11/ccm3_036121.doc).

Your status may depend on whether you plan to use your course paper as an opportunity to conduct research which contributes to the knowledge base in health policy or services research and thus may seek out opportunities to publish your paper. It is up to each student to determine his or her status and act accordingly. Note that receiving IRB approval may take some time, so students should start this process several weeks before the research has actually begun. In order to submit to the IRB, you must have received an ethics certificate after successfully completing the CITI module. If you have not done so, please start this process immediately.

**UNC Honor Code**

The principles of academic honesty, integrity, and responsible citizenship govern the performance of all academic work and student conduct at the University as they have during the long life of this institution. Your acceptance of enrollment in the University presupposes a commitment to the principles embodied in the Code of Student Conduct and a respect for this most significant Carolina tradition. Your reward is in the practice of these principles.

Your participation in this course comes with the expectation that your work will be completed in full observance of the Honor Code. Academic dishonesty in any form is unacceptable, because any breach in academic integrity, however small, strikes destructively at the University’s life and work.

If you have any questions about your responsibility or the responsibility of faculty members under the Honor Code, please consult with someone in either the Office of the Student Attorney General (966-4084) or the Office of the Dean of Students (966-4042).

**Specific honor code guidelines for HPAA 883 are as follows:**

Students are allowed and encouraged to collaborate on class assignments unless instructed otherwise. To emphasize the importance of integrity and intellectual property in the profession, you are required on each assignment to list those individuals with whom you collaborated, and attribute from whom you have borrowed any specific ideas (such as the approach used to solve a homework problem). Students are also reminded that they must at all times abide by the UNC Code of Student Conduct.

***Students should **not** consult any available homework answers from prior years, as the homework problems may remain the same from year to year. Students may work together **before** they begin the write-up of their homework assignments, but written homework answers **should not be shared** before grading is complete.***

Exams from prior years without answer keys will be made available to use as practice exams. Students are welcome and encouraged to review their answers to practice exams with other...
members of the class at any time.

Course Evaluation

The Department of Health Policy and Management is participating in the Carolina Course Evaluation System (CES), the university's online course evaluation tool, enabled at the end of each semester. Your responses will be anonymous, with feedback provided in the aggregate; open-ended comments will be shared with instructors, but not identified with individual students. Your participation in CES is a course requirement, as providing constructive feedback is a professional expectation. Such feedback is critical to improving the quality of our courses, as well as providing input to the assessment of your instructors.

Valuing, Recognizing, and Encouraging Diversity

Promoting and valuing diversity in the classroom enriches learning and broadens everyone’s perspectives. Inclusion and tolerance can lead to respect for others and their opinions and is critical to maximizing the learning that we expect in this program. This may challenge our own closely held ideas and personal comfort zones. The results, however, create a sense of community and promote excellence in the learning environment.

Diversity includes consideration of (1) the variety of life experiences others have had, and (2) factors related to “diversity of presence,” including, among others, age, economic circumstances, ethnic identification, disability, gender, geographic origin, race, religion, sexual orientation, social position.

This class will follow principles of inclusion, respect, tolerance, and acceptance that support the values of diversity.

Disability Accommodation

UNC-CH supports all reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability, or a pregnancy complication resulting in difficulties with accessing learning opportunities. All accommodations are coordinated through the UNC Office of Accessibility Resources & Services (ARS), http://accessibility.unc.edu; phone 919-962-8300, email accessibility@unc.edu. Students must document/register their need for accommodations with ARS before accommodations can be implemented.