Description

This course examines maximum likelihood estimation (MLE), and particularly focuses on the application of maximum likelihood approaches to theoretical questions of substantive interest in the discipline. This course is a highly applied course: we will focus less on maximum likelihood theory (though we will cover this as well) than on the application of MLE to tests of the implications of theoretical models in political science. I assume that all students are familiar with the assumptions and techniques of OLS, as covered in POLI 706.

Over the course of the semester our primary focus will involve developing accurate empirical models to test empirical implications of theoretical models. In other words, the motivation for this course will be much the same as with the EITM program, although the focus of this course will be less on formal theoretic models than in the EITM workshops. The core ML models we will examine in this course are logit and probit, ordered logit and ordered probit, multinomial logit and multinomial probit, event count models, selection models, spatial models, and multilevel models.

Note, I do not expect you to become methodologists as a consequence of taking this course. Instead, I expect you to become more effective, theoretically-oriented political scientists. As a consequence, during the semester, students will:

- Develop a basic understanding of MLE techniques (in order to incorporate them into their own research)
- Develop the skills necessary to learn new MLE approaches independently
- Develop the ability to think about and implement the steps necessary to design well-crafted empirical models
- Develop the capacity to engage in high-quality empirical research
General Expectations

I expect all students to behave professionally in this class. You are responsible for completing all readings and attending class prepared to ask and/or field questions. I will not tolerate disruptive behavior, including (but not limited to) reading newspapers, talking during lectures, use of cell phones or pagers, and insulting classmates or the instructor. Additionally, I expect all students to attend class prepared and to show up on time. It is disrespectful to the instructor and the other students when individuals show up late or are not prepared to participate in the class discussion.

Class Readings

For each class session I have listed readings which cover both technical/theoretical issues and applied analyses. You must complete the required readings for each class, and come prepared to thoroughly discuss each work or ask relevant questions about specific techniques. If you do not complete the readings prior to class, our discussions will become burdensome and consequently, you will not learn these techniques efficiently.

Academic Honesty and Integrity

Students’ work in this course is expected to be their own. The University’s commitment to academic integrity is enshrined in the Carolinian Creed and is detailed in the Rule of Academic Responsibility. Information on violations of academic honesty and integrity and the Universitys punishments for these violations can be found in the Carolina Community Student Handbook (Student Affairs Policy STAF 6.25). It is the students responsibility to be aware of and adhere to the Rule of Academic Responsibility, which can be found online at http://www.sc.edu/policies/staf625.pdf

Disabilities Issues

Students with disabilities should contact me during the first week of the semester about their needs and any assistance or arrangements that may be necessary. Students with disabilities should also contact the Office of Disability Services (ODS) at 777-6742 to learn about the many programs and services that the University provides.

Books

There are two required books and three recommended books.

The required books are:


The recommended books are:

Social Scientists. Cambridge: Cambridge University Press.

Grading
Grades in this course will be determined as follows:

- Class Participation (10% of the course grade)
- Homework Assignments (20% of the course grade)
- Final Exam (30% of the course grade)
- Research Paper (40% of the course grade)

Participation
Since this is a graduate level seminar, participation is essential (note I do not mention attendance because I believe attendance is mandatory). Students are responsible for offering their thoughts and opinions without solicitation from the instructor.

Homework Assignments
Periodically throughout the semester you will be assigned problem sets for analysis based either on specific articles (for theoretical analysis) or datasets which I distribute (for statistical analysis). All statistical analyses must be completed using R and printed using \LaTeX. R is the most adaptable software for work in political methodology and it is important to become adept at using R while you are in graduate school. \LaTeX is the best editor for printing equations and learning how to use it effectively is a must for scholars doing work in (applied) political methodology. I will not accept assignments that are not typed using \LaTeX and/or turn in direct output from R (without putting in tables). You are allowed (and encouraged) to discuss the exercises with each other and work in groups. However, the written results must be the product of your own labor, and consequently are to be completed independently.

Final Exam
Students are required to complete a final exam at the end of the semester. The exam will be distributed the morning of Friday, April 25th and is due (i.e., a typed, hard copy) by noon on Monday, April 28th. You will have just over 72 hours to complete the exam (which is open-book, open-notes format). The exam will consist of two sections (theoretical and applied) and you will have a choice of questions to answer. I expect answers to be as thorough as possible, explain alternatives when applicable, and include relevant statistical theories and formulas.
Research Paper

Students will complete an empirical research paper suitable for presentation at a professional political science conference. By the end of the first month, each student must submit a 1-2 page research proposal that includes a detailed research question describing the analysis and a description of the research design (including methodology) employed to analyze the question. The final draft is due toward the end of the semester, the week prior to the final exam. Since this is a class on research methodology, I expect that each paper will correctly incorporate an MLE approach or approaches as part of the empirical examination. While you can choose to collect original data, I would not recommend this path because I doubt that you will be able to perform both the data collection and analysis in sufficient time to write a quality paper. Rough drafts may be submitted to me (an option I strongly recommend) with suitable time for me to review and make comments which you can incorporate into the final draft.

Course Schedule

Week 1: Course Introduction
No readings assigned.

Week 2
No class — Martin Luther King, Jr. Day

Week 3: Linking Theory and Methods

Week 4: Review of the OLS Model
Long, Chapter 2

Week 5: Theory of Maximum Likelihood
King, Chapters 1-4

Long, Section 2.6

Week 6: Logit/Probit

King, Section 5-5.3
Long, Chapter 3

Week 7: Interpreting MLE Coefficients

Week 8: Ordered Logit/Ordered Probit
Long, Chapter 5
King, Section 5.4

Week 9
No Class — Spring Break

Week 10: Multinomial Logit/Probit & Conditional Logit
Long, Chapter 6
Week 11: Event Count Models
Long, Chapter 8
King, Chapter 5.7

Week 12: Survival Models

Week 13: Selection Models

Week 14: Multilevel Models

Week 15: Spatial Models
Darmofal, David. 2006. “The Political Geography of Macro-Level Turnout in American Political
Development.” *Political Geography* 25(2): 123-150.


**Week 16: Wrapping it Up**