

Economics 673: Nonparametric Econometrics
Department of Economics, Finance and Legal Studies
University of Alabama
Spring, 2024

Professor: Daniel J. Henderson
Lecture: MW, 9:30 – 10:45, Hewson Hall 2021
Office: Alston 262
Office Hours: T, 9:30 – 11:30, or by appointment
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Course Description:

This course systematically and thoroughly covers a vast literature on the modern nonparametric and semiparametric statistics and econometrics that has evolved over the last few decades. This course will discuss the principles of various nonparametric methods to the topics covered in a first-year graduate course in econometrics. This course will provide intuitive explanations of difficult concepts, heuristic and rigorous developments of theory, programming and empirical examples emphasizing on the usefulness of the modern nonparametric techniques to the analysis of economic data. Also, we might cover some topics motivated from students in their own research, such as causal estimation and inference.

Textbooks:

Henderson, D.J. and C.F. Parmeter (2015). *Applied Nonparametric Econometrics*. Cambridge University Press.

Fan, J. and I. Gijbels (1996). *Local Polynomial Modeling and Its Applications*. Chapman and Hall, London.

Li, Q. and J.S. Racine (2006). *Nonparametric Econometrics: Theory and Practice*. Princeton University Press.

Pagan, A. and A. Ullah (1999). *Nonparametric Econometrics*. Cambridge University Press.

Racine, J.S. (2019). *An Introduction to the Advanced Theory and Practice of Nonparametric Econometrics: A Replicable Approach Using R*. Cambridge University Press.

Prerequisites:

Students taking this course should have some prior graduate level econometrics or equivalent knowledge. Also, it requires students be proficient in a computer package (statistical software, say R).

Grading Policy:

The course will consist of several homework assignments, one in-class midterm examination and one project (due the last week of classes). The project will require the students to write an empirical paper using nonparametric methods (topic to be approved prior to the midterm and project will be

presented during the final week of classes). The course grade will be determined according to the following formula:

Homework	25%
Midterm	35%
Project	40%

Note that homework assignments will require the student to use a statistical software package and to turn in output from that package. Further note that no late assignments will be accepted.

Course Outline:

1. Nonparametric density estimation
 - a. Univariate
 - b. Multivariate
 - c. Bandwidth selection
 - d. Testing
2. Nonparametric regression
 - a. Estimation
 - b. Testing
3. Mixed data
 - a. Density
 - b. Regression
4. Semiparametric regression
 - a. Partially linear
 - a. Single index
 - b. Varying coefficient
 - d. Additively separable
5. Advanced topics
 - a. Endogeneity
 - b. Panel data
 - c. Causal estimation and inference
 - d. Imposing economic constraints

Note that the schedule is subject to change depending on the pace of the course.

Academic Honor Code

All students in attendance at The University of Alabama are expected to be honorable and observe standards of conduct appropriate to a community of scholars. The University of Alabama expects from its students a higher standard of conduct than the minimum required to avoid discipline. At the beginning of each semester and on tests and projects, at the discretion of the course instructor, each student will be expected to sign an Honor Pledge.

The Academic Honor Pledge reads as follows: I promise or affirm that I will not at any time be involved with cheating, plagiarism, fabrication, or misrepresentation while enrolled as a student at The University of Alabama. I have read the Academic Honor Code, which explains disciplinary procedures that will result from the aforementioned. I understand that violation of this code will result in penalties as severe as indefinite suspension from the University.

Disability Statement

If you are registered with the Office of Disability Services, please make an appointment with me as soon as possible to discuss any course accommodations that may be necessary. If you have a disability, but have not contacted the Office of Disability Services, please call (205) 348-4285 or visit 133-B Martha Parham Hall East to register for services. Students who may need course adaptations because of a disability are welcome to make an appointment to see me during office hours. Students with disabilities must be registered with the Office of Disability Services, 133-B Martha Parham Hall East, before receiving academic adjustments.

Severe Weather Protocol

In the case of a tornado warning (tornado has been sighted or detected by radar, sirens activated), all university activities are automatically suspended, including all classes and laboratories. If you are in a building, please move immediately to the lowest level and toward the center of the building away from windows (interior classrooms, offices, or corridors) and remain there until the tornado warning has expired. Classes in session when the tornado warning is issued can resume immediately after the warning has expired at the discretion of the instructor. Classes that have not yet begun will resume 30 minutes after the tornado warning has expired provided at least half of the class period remains.

UA is a residential campus with many students living on or near campus. In general classes will remain in session until the National Weather Service issues safety warnings for the city of Tuscaloosa. Clearly, some students and faculty commute from adjacent counties. These counties may experience weather related problems not encountered in Tuscaloosa. Individuals should follow the advice of the National Weather Service for that area taking the necessary precautions to ensure personal safety. Whenever the National Weather Service and the Emergency Management Agency issue a warning, people in the path of the storm (tornado or severe thunderstorm) should take immediate lifesaving actions.

When West Alabama is under a severe weather advisory, conditions can change rapidly. It is imperative to get to where you can receive information from the National Weather Service and to follow the instructions provided. Personal safety should dictate the actions that faculty, staff and

students take. The Office of Public Relations will disseminate the latest information regarding conditions on campus in the following ways:

- Weather advisory posted on the UA homepage
- Weather advisory sent out through Connect-ED--faculty, staff and students (sign up at myBama)
- Weather advisory broadcast over WVUA at 90.7 FM
- Weather advisory broadcast over Alabama Public Radio (WUAL) at 91.5 FM
- Weather advisories are broadcast via WUOA/WVUA-TV, which can be viewed across Central Alabama. Also, visit wvuatv.com for up-to-the-minute weather information. A mobile Web site is also available for your convenience.

Make-up final exams

If a legitimate conflict exists, you may request a make-up exam from the instructor. If you choose to request a make-up exam for this course, you must do so (in writing) before the drop deadline. It is the student's responsibility to learn from the instructor if the request has been approved. Only students who are approved may take a make-up final exam. Students who have not requested a make-up exam in this course by the drop deadline will be required to resolve conflicting exams with the instructor in one of their other courses.

UAct:

The University of Alabama is committed to an ethical, inclusive community defined by respect and civility. The UAct website (www.ua.edu/uact) provides extensive information on how to report or obtain assistance with a variety of issues, including issues related to dating violence, domestic violence, stalking, sexual assault, sexual violence or other Title IX violations, illegal discrimination, harassment, child abuse or neglect, hazing, threat assessment, retaliation, and ethical violations or fraud.

Generative AI Tools

All submitted work must be produced by the students themselves, whether individually or collaboratively. Use of a generative AI tools such as ChatGPT may only be used with written permission from the instructor.

Statement on COVID-19

All University faculty, staff, and students are expected to maintain a commitment to the health and safety of our campus community. Due to the current COVID-19 pandemic, specific health and safety standards are in place to minimize exposure and community spread on campus. In the interest of your health and safety and that of all UA students, faculty and staff, the University reserves the right to change the mode of instruction or schedule of instruction at any time, based upon prevailing public health and other guidance. While the method of delivery may change, educational instruction and opportunities will continue. As such, the University will not provide a refund of tuition, in whole or in-part, based on any such changes. Detailed information on changes in format or schedule can be found at studentaccounts.ua.edu and financialaid.ua.edu.

Getting vaccinated is the best way to Protect Our Herd. COVID-19 vaccines are being administered by the University Medical Center, the Student Health Center and various businesses and healthcare providers.