University of Florida
Department of Economics
Fall 2025

Econometric Methods I
ECO7426

Instructor:	Ignacia Mercadal	**Time:**	M&W 11:45 – 1:40pm
Email:	imercadal@ufl.edu	**Room:**	MAT 119
Office Hours:	Tuesdays 1:00pm–3:00pm	Sign up for an appointment here	

Course Description and Objective

This course is part of the second year sequence in econometrics offered for Ph.D. students in economics. The goal of the class is to provide Ph.D. students with tools that can be useful in applied research. We will cover topics including non-linear models, maximum likelihood estimation, the generalized method of moments, and an introduction to non-parametrics.

Textbooks and Readings:

The class will mostly use Hansen (2022a), which you have already used in the first year, but you can consult any of the books below for reference.

- Bruce Hansen (2022a). *Econometrics*. Princeton University Press (Hansen Probability)
- William H Greene (2012). *Econometric Analysis*. Pearson (Hansen Econometrics)
- Jeffrey M Wooldridge (2010). *Econometric Analysis of Cross Section and Panel Data*. MIT press

We will also discuss papers that apply the methods covered in the course. Each class, a student will guide the discussion, but everyone is expected to participate after having read the paper in advance.

Topics

1. Maximum Likelihood Estimation and M-estimators

    - Hansen (2022b) Ch. 10
    - Hansen (2022a) Ch. 22, 23
    - Daniel Treisman (2016). "Russia's Billionaires". In: *American Economic Review* 106.5, pp. 236–241
    - Timothy F Bresnahan (1987). "Competition and Collusion in the American Automobile Industry: The 1955 Price War". In: *The Journal of Industrial Economics*, pp. 457–482

2. Discrete Choice Models

    - Hansen (2022a) Ch 25, 26
    - Steven T Berry (1994). "Estimating Discrete-Choice Models of Product Differentiation". In: *The RAND Journal of Economics*, pp. 242–262
    - Aviv Nevo (2001). "Measuring Market Power in the Ready-To-Eat Cereal Industry". In: *Econometrica* 69.2, pp. 307–342
    - Timothy F Bresnahan and Peter C Reiss (1991). "ENtry and Competition in Concentrated Markets". In: *Journal of political Economy* 99.5, pp. 977–1009
    - John Rust (1987). "Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher". In: *Econometrica: Journal of the Econometric Society*, pp. 999–1033
    - Katja Seim (2006). "An Empirical Model of Firm Entry With Endogenous Product-Type Choices". In: *The RAND Journal of Economics* 37.3, pp. 619–640

3. Tobit and Selection Models

    - Hansen (2022a) Ch. 27
    - Thomas A. Mroz (1987). "The Sensitivity of an Empirical Model of Married Women's Hours of Work to Economic and Statistical Assumptions". In: *Econometrica* 55.4, pp. 765–799. ISSN: 00129682, 14680262. URL: http://www.jstor.org/stable/1911029 (visited on 07/09/2025)

4. Quantile Regression

- Hansen (2022a) Ch. 24
- https://link.springer.com/article/10.1007/s00181-021-02186-1
- Quantile Regression, JEP
- Martina Pons (2022). "The Impact of Air Pollution on Birthweight: Evidence From Grouped Quantile Regression". In: *Empirical Economics* 62.1, pp. 279–296

5. Nonparametric and Semiparametric Estimation

   - Hansen (2022b) Ch. 17
   - Hansen (2022a) Ch. 19, 20
   - Patrick Bajari and Ali Hortacsu (2005). "Are Structural Estimates of Auction Models Reasonable? Evidence From Experimental Data". In: *Journal of Political economy* 113.4, pp. 703–741

Additional Topics

6. Identification (time dependent)

   - Arthur Lewbel (2019). "The identification zoo: Meanings of identification in econometrics". In: *Journal of Economic Literature* 57.4, pp. 835–903

7. Structural vs. Non-Structural

   - Michael P Keane (2010). "Structural vs. atheoretic approaches to econometrics". In: *Journal of Econometrics* 156.1, pp. 3–20
   - Christopher R Knittel (2011). "Automobiles on Steroids: Product Attribute Trade-Offs and Technological Progress in the Automobile Sector". In: *American Economic Review* 101.7, pp. 3368–99
   - Aviv Nevo and Michael D Whinston (2010). "Taking the Dogma Out of Econometrics: Structural Modeling and Credible Inference". In: *Journal of Economic Perspectives* 24.2, pp. 69–82

8. Introduction to Machine Learning (time dependent)

   - Hansen Ch. 29

- Gareth James et al. (2013). *An Introduction to Statistical Learning*. Vol. 112. Springer Ch. 1, 4, 6
- Susan Athey and Guido W Imbens (2019). "Machine learning methods that economists should know about". In: *Annual Review of Economics* 11.1, pp. 685–725
- Melissa Dell (2025). "Deep learning for economists". In: *Journal of Economic Literature* 63.1, pp. 5–58

9. Partial Identification (time dependent)

    - Philip A Haile and Elie Tamer (2003). "Inference with an incomplete model of English auctions". In: *Journal of Political Economy* 111.1, pp. 1–51

Tentative Schedule

Monday	Wednesday
8/ 25 Syllabus	8/27 Maximum Likelihood and M-Estimators
9/ 1 **Labor Day - no class**	9/3 Maximum Likelihood and M-Estimators
9/8 Maximum Likelihood and M-Estimators	9/10 Binary Choice
9/15 Binary Choice	9/17 Problem Set 1 Multinomial Models
9/22 Multinomial Models	9/24 Multinomial Models
9/29 Multinomial Models	10/ 1 Problem Set 2 Multinomial Models
10/6 **Exam 1**	10/8 Truncation and Sample Selection
10/13 Truncation and Sample Selection	10/15 Quantile Regression
10/20 Quantile Regression	10/22 Project Discussion

Monday	Wednesday
10/27 Nonparametrics	10/29 Proposal Lit Review Nonparametrics
11/ 3 Topics: Identification	11/5 Problem Set 3 Project Discussion
11/10 Topics: Structural vs non-structural	11/12 Student Presentations
11/17 Student Presentations	11/19 Student Presentations
11/24 **Thanksgiving Break**	11/26 **Thanksgiving Break**
12/ 1 Problem Set 4 Project Discussion	12/3 **Final Exam**
12/8	12/10 **Research Proposal Due**

Assignments and Grading:

Your grade will be based on performance on problem sets (15%), two exams (25% each), in-class presentations and participation (15%), and a research proposal (20%).

You are welcome to discuss assignments with other students, but you must turn in your own work on Canvas. Please use RMarkdown or equivalent for assignments that include code, and make sure the code runs, I will not fix bugs. I recommend R, but you can use any programming language.

Grading will be according to the following scheme:

Score	Grade
94 - 100	A
90 - 93.99	A-
87 - 89.99	B+
83 - 86.99	B
80 - 82.99	B-
77 - 79.99	C+
73 - 76.99	C
70 - 72.99	C-
67 - 69.99	D +
64 - 66.99	D
61 - 63.99	D-
0 - 60	E

This course complies with all UF academic policies. For information on those polices and for resources for students, please see this link. Make-up exams will be arranged only for absences that are explicitly covered by the UF Attendance Policy. Whenever possible, you should reach out at least ten business days in advance to arrange a make-up exam. Of course, this will

not always be possible. Unforeseen absences and emergencies occur and can be excused without such advance notice. In most cases, you will be asked to provide evidence or documentation of an absence that is explicitly excused by the UF Attendance Policy. Absences related to religious holidays and worship do not require this documentation.

Research Proposal

The proposal must identify a question of economic interest that has not been answered in the literature, and propose a concrete way to use available data to answer it. Proposals usually contain some descriptive figures or preliminary regressions suggesting that we can learn something useful from the variation in the data. Alternatively, you can reproduce the results of an existing paper and find at least one interesting change or addition that would extend improve on the paper's econometric analysis.

You may choose any topic (subject to my approval), **as long as you use some of the tools studied in class**. You can work individually or in pairs. There will be three deliverables associated to the project (details for each of them will be available on Canvas):

- **October 29**: 2-4 pages. Literature review ($\sim$ 5 papers) on the topic of interest. Identify question and data.
- **November 12, 17, 19**: In-class presentations.
- **December 10**: Final Proposal Due

Student Evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available here. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Health Counseling and Emergencies

- **U Matter, We Care**: If you or a friend is in distress, please contact umatter@ufl.edu or 352-392-1575 so they can reach out and help.
- Counseling and Wellness Center: Reach by phone at 352-392-1575, and the University Police Department: 392-1111 or 9-1-1 for emergencies.
- **Sexual Assault Recovery Services (SARS)**: UFPD Office of Victim Services (confidential) (352) 392-5648, Student Health Care Center, 352-392-1161.
- University Police Department at 352-392-1111 (or 9-1-1 for emergencies).

Cheating and Plagiarism:

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."" The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. You should familiarize yourself with the Student Honor Code and Student Conduct Code. Cheating and plagiarism are not the only violations of this policy. Importantly, ignorance of a policy is not a valid reason for violating it. If you have any questions or concerns, please consult with the instructor or TA.

The Department of Economics faculty assume that all work that is submitted for grading is written by the student whose name it bears, and that it represents their ideas and work. Accordingly, students are not permitted to use generative AI when completing assignments, quizzes, exams, or other graded work unless their instructor has expressly granted that permission. Unauthorized use of generative AI may constitute cheating and/or plagiarism. Such violations of the UF Student Honor Code will be reported to the UF Dean of Students Office and will be subject to severe sanctions.

Generative AI includes but it not limited to ChatGPT, DALL-E, and Google Gemini, Claude.

Disability Accomodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should register with the Disability Resource Center. Once registered, students will receive an accommodation letter that can be presented to the instructor when requesting accommodations. Please register at the beginning of the course if seeking accommodations. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.