Course Details:
Professor: Michael S. Delgado
Class Schedule: MW 9:30-11:20 KRAN G007
Office: KRAN 635
Office Hours: TH 10:00-11:00am, by appointment, or walk-in
Email: delgado2@purdue.edu

Course Description:
This course covers the basics of nonparametric estimation, emphasizing application of nonparametric methods. We will cover estimation of densities, regression functions, and testing. Further topics will include incorporation of discrete data into a nonparametric framework, semiparametric regression, and instrumental variables regression. Throughout each section we will read empirical papers that have deployed the methods to gain further empirical insight.

Textbook and Materials:
*Applied Nonparametric Econometrics*, Henderson and Parmeter, 2015
*Nonparametric Econometrics: Theory and Practice*, Li and Racine, 2007

I will primarily teach from Henderson and Parmeter, but anyone wishing to study a more theoretical treatment should follow along using Li and Racine.

Software:
You may use whatever software you wish, but the estimation done for your homework needs to be manually programmed. This will help you gain a hands-on understanding of the methods, and provide you with skills to program more complex models that are not yet available in estimation packages. Note, I use R, so I may not be much help if you are using another language.

Grading Policy:
The grade for this course will be based on one comprehensive homework assignment, class participation, and a final exam. Semester grades will be determined according to the following weights:

Homework: 20%
Participation: 50%
Final Exam: 30%

Homework Assignment:
For a dataset of your choosing, the homework assignment will take you through a variety of common nonparametric models. The assignment is due by the last day of class. Late homeworks will not be accepted unless there is a university approved absence.

Class Participation:
Within each section we will read empirical papers that have applied nonparametric techniques to economic data. For each paper, a student will prepare a 10-15 minute presentation of the paper that will help generate discussion. Your class participation grade will depend on your presentations, as well as your participation in class discussions.
Final Exam:
The final exam will be on **Monday, May 2 from 8:00-10:00am** in KRAN G007. Please let me know if there are any conflicts as soon as possible. A make-up exam will not be given unless there is a documented university approved absence.

Communication:
My primary method of communication will be through your Purdue email address. Please check it often.

Campus Emergencies:
In the unusual event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. To get information about changes in this course contact me by email or call me at my office. To report an emergency, call 911. To obtain updates regarding an ongoing emergency, sign up for Purdue Alert text messages, view [www.purdue.edu/ea](http://www.purdue.edu/ea). There are nearly 300 Emergency Telephones outdoors across campus and in parking garages that connect directly to the PUPD. If you feel threatened or need help, push the button and you will be connected immediately. If we hear a fire alarm during class we will immediately suspend class, evacuate the building, and proceed outdoors. Do not use the elevator. If we are notified during class of a Shelter in Place requirement for a tornado warning, we will suspend class and shelter in the basement. If we are notified during class of a Shelter in Place requirement for a hazardous materials release, or a civil disturbance, including a shooting or other use of weapons, we will suspend class and shelter in the classroom, shutting the door and turning off the lights. Please review the Emergency Preparedness website for additional information: [http://www.purdue.edu/ehps/emergency_preparedness/index.html](http://www.purdue.edu/ehps/emergency_preparedness/index.html).

Academic Dishonesty:
University policy on academic dishonesty is clear: academic dishonesty in any form is strictly prohibited. Anyone found to be cheating or helping someone else cheat will be referred directly to the Dean of Students for disciplinary action. Academic dishonesty includes citing someone else’s work as your own, using cheat sheets, or sharing your answers with someone else. If you are unsure whether your planned action constitutes academic dishonesty, seek clarification from the instructor. Details of the Purdue University academic integrity policies can be found here: [http://www.purdue.edu/purdue/about/integrity_statement.html](http://www.purdue.edu/purdue/about/integrity_statement.html).

Special Needs:
If you have a disability that requires academic adjustments, please make an appointment to meet with me during the first week of classes to discuss your needs. Please note that university policy requires all students with disabilities to be registered with the Disability Resource Center in Young Hall (765-494-1247) before classroom accommodations can be provided. Accommodations will be made based on documentation from the Purdue University Disability Resource Center.

Course Outline and Reading List:

1. Introduction: Parametric vs Nonparametric
   Henderson and Parmeter, Chapter 1
   Li and Racine, Preface and start of Chapter 1
National Academy of Sciences, 96, 4730-4734.


2. Univariate Density Estimation
   Henderson and Parmeter, Chapter 2
   Li and Racine, Chapters 1 and 5

3. Multivariate Density Estimation
   Henderson and Parmeter, Chapter 3
   Li and Racine, Chapter 1


4. Regression
   Henderson and Parmeter, Chapter 5
   Li and Racine, Chapter 2


5. Semiparametric Regression
   Henderson and Parmeter, Chapter 9
   Li and Racine, Chapters 7-9


6. Discrete Variables
   Henderson and Parmeter, Chapters 7-8
   Li and Racine, Chapters 3-4


7. Testing in Nonparametric Models
Henderson and Parmeter, Chapter 6
Li and Racine, Chapters 12-13


8. Instrumental Variables
Henderson and Parmeter, Chapter 10
Li and Racine, Chapters 16-17


9. Panel Data
Henderson and Parmeter, Chapter 11
Li and Racine, Chapter 19


10. Constrained Nonparametric Estimation
Henderson and Parmeter, Chapter 12
