Wayne State University - Department of Economics
ECO 6100 (001) 10741- Introduction to Econometrics (Fall 2019)

Instructor: Vitor Kamada
Class: MW, 7:30 - 09:10 pm in 8 PREN
Office: 2139 Faculty Administration Building
E-mail: econometrics.methods@gmail.com
Cel: 678 644 5511
Office hours: MW, 4:10 – 5:10 pm in my office
MW, 9:10 – 9:40 pm in 8 Prentis, or by appointment.

1) Course Description

This course introduces several statistical and econometric methods that are frequently used in economic consulting, big corporations, nonprofit organizations, academic research, etc. An important emphasis is put on practical application and on the use of Python Computer Language to analyze real-world datasets. The first part of this course covers causal inference; whereas the second part covers Big Data and Google Data.

2) Learning Outcomes

The main goal of this course is to develop statistical and econometric reasoning. Econometric reasoning involves understanding the logic behind the econometric procedures and being able to fully interpret the results. Furthermore, after this course students will become proficient in using Python to perform a variety of statistical and econometric analysis.

3) Recommended Material

Angrist, J. D. and Pischke, J. (2014). Mastering 'Metrics: The Path from Cause to Effect, Princeton University Press.

Lifelines (2018). Survival Analysis Documentation available for free at: https://lifelines.readthedocs.io/

Rey, S. J. and Arribas-Bel, D. (2018). Geographic Data Science with PySAL. Available for free at: http://darribas.org/gds_scipy16/

Sargent, T. J. and Stachurski, J. (2018). Lectures in Quantitative Economic. Available for free at: https://lectures.quantecon.org/py/

Stephens-Davidowitz, Seth. (2017). Everybody Lies: Big Data, New Data, and What the Internet Can Tell Us About Who We Really Are. Dey Street Books.

4) Required Software

4.1) Python

Python is an open-source programming language. It tends to be the dominant language in many branches of Data Science, such as: Machine Learning, Deep Learning, Natural Language Processing, Network Analysis, and deployment of Big Data infrastructure; etc.

There are several ways to run Python Code. I will use the Google Colab, a free Jupyter notebook environment that runs entirely in the cloud.

If you don't have a Google Account, you will need to create one, before accessing Google Colab at: https://colab.research.google.com/

5) Course Schedule

Part 1 - Econometrics

Date	Topics/Key Concepts
Week 1 **Aug 28**	**1) Randomized Trials** Angrist and Pischke (2014): Ch 1
Week 2 **Sep 2**	**Labor Day**
Week 2 **Sep 4**	**2) Omitted Variables Bias** Angrist and Pischke (2014): Ch 2
Week 3 **Sep 9**	**3) Instrumental Variables (IV) and Local Average Treatment Effect (LATE)** Angrist and Pischke (2014): Ch 3.1 and 3.2
Week 3 **Sep 11**	**4) Two-Stage Least Squares (2SLS)** Angrist and Pischke (2014): Ch 3.3
Week 4 **Sep 16**	**5) Sharp Regression Discontinuity Design** Angrist and Pischke (2014): Ch 4.1
Week 4 **Sep 18**	**6) Fuzzy Regression Discontinuity Design** Angrist and Pischke (2014): Ch 4.2
Week 5 **Sep 23**	**7) Difference-in-Difference (DiD)** Angrist and Pischke (2014): Ch 5.1
Week 5 **Sep 25**	**8) Fixed Effects** Angrist and Pischke (2014): Ch 5.2

Week 6 **Sep 30**	**9) Introduction to Spatial Econometrics** LeSage (2008). Revue d'économie industrielle
Week 6 **Oct 2**	**10) Spatial Econometrics with PySAL** Rey and Arribas-Bel (2018): Part I and II
Week 7 **Oct 7**	**11) Logit and Probit I** Wooldridge (2015): Chapter 17
Week 7 **Oct 9**	**12) Logit and Probit II** Seabold & Perktold (2010). Statsmodels: Econometric and Statistical modeling with Python.
Week 8 **Oct 14**	**13) Poisson Regression** Sargent and Stachurski (2018): Ch 4.4
Week 8 **Oct 16**	**14) Quantile Regression** Angrist and Pischke (2009): Ch 7 Wooldridge (2010): Ch 12.10
Week 9 **Oct 21**	**15) Introduction to Survival Analysis** Lifelines (2018): Kaplan-Meier Survival Function and Hazard Rates
Week 9 **Oct 23**	**16) Survival Regression** Lifelines (2018): Cox Proportional Hazard Model
Week 10 **Oct 28**	**17) Review**
Week 10 **Oct 30**	**18) Midterm**
Week 11 **Nov 4**	**19) Multifaceted Investigation of the Causal Effect** Angrist and Pischke (2014): Ch 6

Part II – Student Presentations based on Davidowitz (2017)

Week 11 **Nov 6**	**Introduction: The Outlines of a Revolution** **1. Your Faulty Gut** **2. Was Freud Right?**	Davidowitz (2017): Introduction, Ch 1, and, Ch 2.
Week 12 **Nov 11**	**3. Data Reimagined** Bodies as Data Words as Data Pictures as Data	Davidowitz (2017): Ch 3
Week 12 **Nov 13**	**4. Digital Truth Serum** The Truth About Sex The Truth About Hate and Prejudice The Truth About the Internet	Davidowitz (2017): Ch 4
Week 13 **Nov 18**	**4. Digital Truth Serum** The Truth About Child Abuse and Abortion The Truth About Your Facebook Friends The Truth About Your Customers Can We Handle the Truth?	Davidowitz (2017): Ch 4

Week 13 **Nov 20**	**5. Zooming In** What's Really Going On in Our Counties, Cities, and Towns? How We Fill Our Minutes and Hours Our Doppelgangers Data Stories	Davidowitz (2017): Ch 5
Week 14 **Nov 25**	**6. All the World's a Lab** The ABCs of A/B Testing Nature's Cruel—but Enlightening—Experiments	Davidowitz (2017): Ch 6
Week 14 **Nov 27**	**Holiday - No Classes**	
Week 15 **Dec 2**	**7. Big Data, Big Schmata? What It Cannot Do** The Curse of Dimensionality The Overemphasis on What Is Measurable **8. Mo Data, Mo Problems? What We Shouldn't Do** The Danger of Empowered Corporations The Danger of Empowered Governments Conclusion: How Many People Finish Books?	Davidowitz (2017): Ch 7, Ch 8, and Conclusion

Part III - Final

Week 15 **Dec 4**	**Draft Empirical Report**	
Week 16 **Dec 9**	**Study Day**	
Week 16 **Dec 11**	**Final Exam** **Empirical Report**	

5) Grading

5.1) Your final grade will be assessed as follows:

Assignment	Weight	Date
Surveys*	1%	Wednesday, Sep 25 (at 4:00 pm)
Homework	40%	Check on Canvas
Midterm	20%	Wednesday, Oct 30
Presentation	20%	Check on Canvas
Empirical Report	19%	Wednesday, Dec 11 (at 4:00 pm)
Total	100%	

* You can answer the surveys "Demographics and Study Methodology" and "Early Course Evaluation" on Canvas.

Grading Scale

94+ = A	74+ = C
90+ = A-	70+ = C-
87+ = B+	67+ = D+
84+ = B	64+ = D
80+ = B-	61+ = D-
77+ = C+	Below 61 = F

5.2) Instructions for Surveys, Homework, Presentation, and Empirical Report

Guidelines and detailed instructions about Surveys, Homework, Presentation, Empirical Report are available on Canvas.

5.3) Makeup Policy for any Assignment

If you miss any Assignment, I will provide a makeup activity in the case of an excused and unavoidable absence. Then it is YOUR RESPONSIBILITY to provide satisfactory written documentation of an excused and unavoidable absence as soon as possible. For example, if you are ill – the accompanying doctor's note must say that you cannot (or could not) do the Homework or Lab. If the doctor's note does not state this clearly, your score will be zero.

6. Course Expectations

6.1) Clarifying Expectations

To succeed in this course, you'll need to invest a good amount of time and energy doing exercises outside the class time. If at any time you feel you're investing the required time and energy but aren't learning the material or improving your skills, contact me and I'll do my best to help you and to suggest additional resources and options. If you have questions or concerns that you believe can be handled via e-mail, feel free to contact me that way. If I cannot adequately respond to your question via e-mail, I'll ask you to come to my regular office hours or make an appointment.

6.2) Academic Integrity

Wayne State University aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Student Code of Conduct, please see https://doso.wayne.edu/conduct/codeofconduct.pdf. Students who commit or assist in committing dishonest acts are subject to sanctions described in the Student Code of Conduct.

6.3) Special Accommodations

If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.