AEB 7572 – 101F Econometric Methods II - Spring 2016
Syllabus
University of Florida
Food and Resource Economics Department

Instructor:
Gülcan Önel
Office: McCarty B #1095
Email: gulcan.onel@ufl.edu
Class Meets: Tuesdays 1:55-2:45 PM and Thursdays 1:55-3:50 PM in MCCA 3194 (McCartyHall)
Lab reserved: Thursdays 1:55 – 4:55 PM in MCCB 3086 (CALS computer lab)
Office Hours: Wednesdays 10:00 AM- 12:00 PM, or by appointment.

Course Objective:
This course is designed for first-year Economics Ph.D. students. The basic methods of modern econometric theory are covered. The intention is that the material will provide a foundation for applied research in economics. The focus of the course will be on the specification and estimation of linear models, with particular attention to estimator properties and hypothesis testing under different statistical assumptions. The prerequisite is AEB 7571 - Econometrics I (or, "Mathematical Statistics") in FRE, or its equivalent.

Course Website:
The course website will be available through UF's Canvas "E-learning"system (http://lss.at.ufl.edu/). Important information related to the course, including homework assignments, solutions, and additional readings will be posted on this web site.

Textbooks
The primary text for the class is *Econometric Analysis*, 7th edition (2011) by William Greene. (Older edition is an acceptable substitute)

Some other recommended textbooks:
1. Econometrics (2000) by Fumio Hayashi (Ph.D. level)
2. Econometric Analysis of Cross-Section and Panel Data, J. Wooldridge, Princeton University Press (Ph.D. level).
3. Introductory Econometrics, Jeff Wooldridge, South-Western. (Masters level)
4. A Guide to Econometrics, P.A. Kennedy, MIT Press (excellent as a less-technical supplement to the required text).
5. Estimation and Inference in Econometrics, R. Davidson and J. MacKinnon, Oxford U. Press.
6. A Companion to Theoretical Econometrics, edited by B. Baltagi, Blackwell Publishing.
7. Bruce Hansen's online Econometrics text: http://www.ssc.wisc.edu/~bhansen/econometrics/Econometrics.pdf

Grading

Homework assignments	20%	
Midterm 1	25%	Feb 18, 2016
Midterm 2	25%	Apr 7, 2016
Poster Presentation	30%	April 15, 2016 (Time is TBA)

There will be several homework assignments throughout the semester. These will be handed out in class, and will be due roughly a week to ten days after they are assigned. The exact due dates will be specified on each assignment. Late submissions will not be accepted.

There will be no final exam for the course. Instead, each student will prepare a term project, and will present it in a 'poster presentation' format at the end of the semester. The exact logistics of the poster session will be announced in class later. No Make-up exams will be given. If you happen to miss one of the midterms for a reasonable, well-documented excuse (court, illness etc.), then your remaining midterm score will account for 50% of your total grade instead of 25%. If you don't have an acceptable excuse, you will not receive any credit for the missed exam.

Course Grading Scale

A	93	-	100	4.00
A-	87	-	92	3.67
B+	84	-	86	3.33
B	81	-	83	3.00
B-	78	-	80	2.67
C+	75	-	77	2.33
C	72	-	74	2.00
C-	69	-	71	1.67
D+	65	-	68	1.33
D	60	-	64	1.00
D-	56	-	59	0.67
E	<56			0.00

Software:

We will use SAS -mostly its matrix programming language, SAS/IML- for computer assignments. SAS has well-defined routines (Proc Reg, Proc Model, Proc Syslin, etc.) that easily perform many of the methods we will cover in this course. However, using a matrix programming language to program the methods reinforces our understanding of the underlying theory. You need not have any prior experience with SAS since I will be providing necessary resources and tutorials to get you started.
That being said, if you are already proficient in another matrix programming language, such as Matlab or GAUSS, you may use that to answer the empirical parts of homework assignments. Whichever software you choose to use, you must provide all the code and the relevant output along with your answers. Note that I will provide only SAS code in as an answer key, and I can't provide any support for other software.

There are multiple options to use SAS.
SAS has an academic version with three options. Here is a link that compares them: http://www.sas.com/en_us/offers/14q1/122603-sas-for-academia/overview.html

1- First option is installing *SAS University Edition* directly from http://www.sas.com/en_us/software/university-edition.html . Note that this version does not have every component of SAS (only the basics), but is sufficient to get you through the homework. If you want to use SAS in the future for your research, I suggest considering the next option.

2-Second option is to get the *Educational Analytical Suite*. You can get the installation CD from the Help Desk at the Hub or from the UF Bookstore for a small fee (See https://software.ufl.edu/agreements/sas/student/)

3- Third option is to use *SAS on Demand for Academics* **on cloud.** This does not require installing anything on your machine; you simply access and use the software via a web browser (including Safari). The software you access through the cloud should be the same as the software you can purchase at UF. However, there is a 5 GB data/storage limit. Here is the link to access *SAS on Demand*: http://www.sas.com/en_us/industry/higher-education/on-demand-for-academics.html

Of course, you can always use SAS on University computer labs. SAS version 9.4 is available on computers in the FRE lab (see http://www.fred.ifas.ufl.edu/graduate/computer-server.shtml).

Term Project (Poster Presentation)

This is essentially an applied econometrics research project. Think of the poster you will be preparing as a very, very brief version of a complete, written research paper.
- The project must be empirical, using real economic data. You can either replicate and extend a research paper written by someone else, or carry out an original analysis that adds an econometric component to a research question you may have previously addressed (or, plan to address soon for your dissertation, second year papers etc). However, (a) the project must be distinct from other class projects you might have assigned this semester, and (b) it must be done by the end of the semester (before the poster presentations session).
- Due to the limited time for this project, I recommend that you focus on a narrow topic that requires a modest volume of data to which you already have access (Think about data sources that are open to public or available through the Library, such as USDA, BLA, BEA, Federal Reserve Bank, World Bank etc).
- You do not have to go beyond basic statistical and econometric techniques that we will introduce in the course. The main purpose of the project is to give you experience in organizing empirical research and using econometric methods appropriate for answering an interesting economic questions. However, if you feel motivated, you may use other econometric methods/tests listed in Greene's Table of Contents even they are not covered in class.
- I prefer that you do not use a class/homework data set, such as from Greene or from one of the classic papers and data sets in other books. These defeats one of our objectives of having you somewhat organize the acquisition and cleaning of data. You may however, take a classic data set and update it or extend it with additional variables.
- Suggestions for finding a topic are to get advice from faculty members in the applied areas you find most interesting, to scan recent empirical journals and working papers (e.g. Journal of Applied Econometrics (provides data sets), American Journal of Agricultural Economics, IDEAS, AgEcon Search, the NBER working paper series (NBER also has great data), or review empirical papers that you have read in other courses.
- Suggestions for analysis are to extend the data set previously employed (e.g., longer series, different industrial sector, more countries), to collect or use additional or alternative variables and do specification tests, or to test alternative economic specifications.
- On **January 26**, you will submit a single-page outline with a brief description of your topic and the econometric techniques you will employ, and details on the data you will use (data size and source, availability etc.). At this stage, my primary interest is in judging the feasibility of your project. Feel free to talk with faculty members in your chosen subject area (including me) about your ideas before submitting this outline. If you are going to extend results from another paper, please attach a copy of that paper to your outline. You must get my approval before finalizing your research topics.
- You must write your own code for the analysis and hand it to me at the end of the semester along with the main output. However, unlike your homework assignments, you are not restricted to only use matrix programming language (SAS-IML) for the project. You may use, for example, SAS

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PROC REG if you are running a simple regression. You may also use other software of your choice (canned or not).

- Your poster <u>must be 36inch (H)x 48inch(W)</u>, and must have the following (fixed) section headings:

> **Introduction:** Give some background, describe the problem and tell the audience why it is an interesting one.
> **Model:** The economic and/or econometric model behind your research question.
> **Methods and Data:** Describe the econometric method you use and your data.
> **Findings:** This section should only have graphs, charts, and tables with minimal text.
> **Discussion:** What are your conclusions from the findings?

- I highly recommend that you to use Power Point for making your poster. A poster is one big PPT slide (A PPT slide can be as big as 56inchx56 inch). Here is a good set of tips for designing your poster in Power Point: http://www.aaea.org/UserFiles/file/Poster_Powerpoint_AgEcon_Search.pdf
- You will need to print your Poster for the poster presentation session at the end of the semester. Luckily, UF has a printing facility in the HUB 224 for this kind of large format printing. Please see the details here: http://helpdesk.ufl.edu/application-support-center/department-paid-printing/poster-print-information/ Please contact the HUB 224 for the details and cost information.
- Easiest way to design a poster is to use a template. Here is a 36x48 inch template from UF Help Desk : http://helpdesk.ufl.edu/wp-content/uploads/2012/11/Poster_Template_36X48.pptx

<u>Tentative Course Outline</u>
Numbers prefixed with H refer to chapters in Hayashi, G to chapters in Greene.

0. Background - no lectures on this material
   A. Introduction (G1)
   B. Matrix algebra (Greene Appendix A)
   C. Probability and distribution theory (Greene Appendix B)
   D. Statistical Inference (Greene Appendix C)

I. The Multiple Regression Model (MRM)
   A. Ordinary Least Squares (H1.1- 1.2, G2 - 3)
   B. The Gauss-Markov Theorem (H1.3, G4.1 - 4.3)
   C. Sampling distributions induced by normality and tests of linear restrictions (H1.4, G4.4 - 4.5, G5.1 -5.3, 5.5)
   D. The method of maximum likelihood (ML) and the Likelihood Principle (H1.5, G14.1-14.3, Greene Appendix E.3)
   E. Specification analysis, the algebra of ellipsoids, and the value of information (G4.7, G5.9 -5.10)
   F. Prediction (G4.6) – no lectures

II. Asymptotic Approximations to Sampling Distributions
(H2.1, Greene Appendix D, G4.4)
   A. Convergence in probability and the weak law of large numbers
   B. Convergence in distribution and the Central Limit Theorem
   C. Asymptotic properties of ML and test statistics related to ML (G5.6 -5.7, G14.4-14.6)
   D. Inverting test statistics to obtain confidence regions

III. Nonspherical Disturbances

A.   The general case of non-scalar disturbance covariance matrix
(G9, H1.6)
    1. Generalized Least Squares (GLS) and ML estimation
    2. Feasible GLS - asymptotic properties
B. Heteroskedasticity (G9.4 -9.6, H2.3-2.8)
    1. consequences for OLS
    2. testing
    3. estimation
C. Serial correlation (H2.10, H8.7)
    1. consequences for OLS
    2. testing
    3. estimation
D. Consistent covariance matrix estimation (H2.2-2.5, H2.9, G9.4.4)
E. The bootstrap (Bruce Hansen's text)

IV. Nonlinear Regression Models
    A. Nonlinear Least Squares Estimator (G7.2)
    B. Large Sample Properties of the Nonlinear Least Squares Estimator
    C. Hypothesis Testing and Parametric Restrictions
    D. Modeling and Testing for a Structural Break (G6.4)

V. Simultaneity
    A. Systems of equations (H2.9, H3.1-3.4, G10)
    B. Errors in variables (H3.2, G8.5)
    C. Lagged endogenous variables with serially correlated disturbances
    D. Identification
    E. Estimation
            1. Instrumental variables and endogeneity testing (G8.3)
            2. Limited information estimation (2SLS and LIML) (H3.4, H3.8, H8.6)
            3. Full information estimation (3SLS and FIML) (H8.5)
            4. Generalized Method of Moments (H3.4, G13.4 -13.6)

VI. Introduction to Time Series Econometrics (as time allows)
    A. Stationarity, and ARIMA processes (H 6.2 G20.3)
    B. Unit Roots (H9 G21.2)
    C. Cointegration (H10 G21.3)

Disclaimer:

The syllabus is a general plan for the course; deviations may be necessary. I hold the right to make changes to this syllabus anytime during the semester as circumstances warrant.

Grades and Grade Points
Information on current policies for assigning grade points, see
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Academic Honesty, Software Use, Campus Helping Resources, Services for Students with Disabilities

Academic Honesty
In 1995 the UF student body enacted an honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students. **The Honor Pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.**
On all work submitted for credit by students at the university, the following pledge is either required or implied: **"On my honor, I have neither given nor received unauthorized aid in doing this assignment."**

Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean, Student Honor Council, or Student Conduct and Conflict Resolution in the Dean of Students Office. *(Source: 2012-2013 Undergraduate Catalog)* It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor.

Software Use:
All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources
Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,* **www.counseling.ufl.edu/cwc/**
    Counseling Services
    Groups and Workshops
    Outreach and Consultation
    Self-Help Library
    Training Programs
    Community Provider Database

- *Career Resource Center,* First Floor JWRU, 392-1601, **www.crc.ufl.edu/**

Services for Students with Disabilities
The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues.

-0001 Reid Hall, 352-392-8565, **www.dso.ufl.edu/drc/**

BIO SKETCH

Name:	Gülcan Önel
Position:	Assistant Professor, Food and Resource Economics Department
Education:	Ph.D., Economics, North Carolina State University, 2011. Masters, Economics, North Carolina State University, 2007. M.A, Applied Economics, Dokuz Eylul University, Izmir, Turkey, 2004. B.A. Economics, Dokuz Eylul University, Izmir, Turkey, 2002.
Experience:	2012-Present, Assistant Professor, University of Florida. 2010-2012, Applied Econometrician and Software Tester, SAS Institute. 2008-2009, Undergraduate Instructor, North Carolina State University.
Courses:	AEB 6933 Time series econometrics (To be taught in spring 2017) AEB 4931, Econometrics AEB 7572, Econometric Methods 2 AEB 4931, Advanced Microeconomics
Research areas:	Supply/Demand and Price Analysis, Agricultural Labor Markets, International Trade, Agricultural Policy, Applied Econometrics (Nonstationary Time-Series and Time-Series Econometrics, Nonlinear Time-Series Models, Panel Data Econometrics).

Notable Achievements:
- Early Career Scientist Award, UF-IFAS, 2014.
- Outstanding Dissertation Award – Honorable Mention, Agricultural and Applied Economics Association (AAEA), 2012.
- Carlson Outstanding Dissertation Award, North Carolina State University, 2012.
- Research Award, The Scientific and Technical Research Council of Turkey (TUBİTAK), 2006.
- Outstanding Thesis Award, Turkish Economic Association, 2004.

Ongoing projects/topics:
- Off-farm work and agricultural labor supply
- The impact of federal immigration programs on agricultural labor markets
- The use of nonstationary panel data with cross-section dependence in agricultural economics
- Farm land valuation
- Exchange rate pass-through and international agricultural prices.
- Demand systems and food consumption patterns