# ECO 2408S (L0201)
# ECONOMETRICS (MFE)

**University of Toronto**
**Department of Economics**
**Winter, 2016**

Professor Angelo Melino
Max Gluskin House, Rm 327
Department of Economics
150 St. George Street

email: angelo.melino@utoronto.ca
http://www.economics.utoronto.ca/melino/

Office hours:
Friday 10-11, or by appt.

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## COURSE DESCRIPTION

This is an introductory graduate level econometrics course for students in the MFE program. The course aims to provide a solid grounding in the practice of econometrics. This entails a balance of theoretical preparation and "hands on" experience. The lectures emphasize econometric theory, but students are given considerable opportunity to put it to use in computer-based assignments and a substantive term paper.

The course assumes basic familiarity with elementary statistics, matrix algebra, and some previous exposure to regression analysis; however, we begin from "square one" with simple regression analysis. By the end of the course, students can expect that they will be able to conduct their own empirical investigations, as well as to evaluate critically econometric and other statistical evidence.

## TEXTBOOK

The required textbook for this course is:

*Introductory Econometrics: A Modern Approach (6th Edition*), by Jeffrey M. Wooldridge (Cengage Learning, 2015). NB: An ebook version was not available as of early January.

As supplementary texts, I recommend:

*Econometric Theory and Methods*, by R. Davidson and J. G. MacKinnon, (OUP Press, 2004)
*Econometric Analysis of Cross Section and Panel Data* (2nd ed), by J. M. Wooldridge (MIT Press, 2010)

The required Wooldridge book is very sophisticated but written at a level accessible to undergraduates. It has a wonderful collection of computer assignments and will be the only book you need for this course. However, my lecture notes will use much more matrix algebra.

Those of you who want a textbook that matches more closely the tone of the lectures may appreciate the Davidson and MacKinnon book. It emphasizes theoretical econometrics, but at a level that MA students can handle. Some of the exercises are real brain teasers. It's a great place to learn the foundations of econometrics. The advanced Wooldridge text is a bit more demanding than I would like, but gives an excellent advanced discussion of many of the topics in the required text using similar notation.

## SOFTWARE

As the course involves a considerable amount of computing, students will have to learn and use a statistical software package. The only package that will be supported *by the TA* is **Stata** (I will also require that you submit Stata programs to document your term paper). Stata is installed on the network of computers in the basement of the Gluskin Building. However, I *strongly* recommend that students purchase a copy of STATA for use on their own computers. Stata can be purchased (in a variety of flavours-- **Stata/IC 14** is the current recommended edition, and you can decide if you want the six-month, one-year or "perpetual" license) and downloaded at a discount price for UofT students directly from Stata.

## GRADING

The final grade will be based on 4 problem sets, a mid-term exam, a final exam, and a term paper, with the following weights:

| Task | Weight | Due Date |
|---|---|---|
| Problem Sets | 10% | Problem Set 1, Jan 27, 2016<br>Problem Set 2, Feb 10, 2016<br>Problem Set 3, Mar 16, 2016<br>Problem Set 4, April 1, 2016 |
| Mid-Term Exam | 22% | Friday, Feb 26, 2016 5-7pm in WW121*** |
| Final Exam | 33% | Exam Period |
| Term Paper | 35% | Due: Monday, April 11, 2016 |

*The problem sets* will involve both theoretical and empirical exercises. Their primary value is to serve as a learning (rather than evaluation) tool, and to help you prepare for the exams and term paper. They will be coarsely graded, and are worth 2.5% each. You will be assigned to a team for each problem set. You are encouraged to collaborate with your classmates, but each team must hand in its own copy of the problem set solution, indicating which other students (if any) made a considerable contribution to their answers. Problem sets are due at the beginning of the lecture. Late problem sets will receive a grade of zero.

*The term paper* requirement will be described in more detail early in the term. It will entail an empirical investigation of an economic question. The paper will involve "original" empirical work, as well as a critical reading of a few pertinent articles related to the question. It must be no longer than 15 pages (double spaced) in length. I will provide a list of candidate topics, but students are advised to select their own topic, subject to my approval, and the paper structure must conform to the project requirements (to be defined later). An outline (statement of topic) will be required by **February 8**. I will award a **5% bonus** for papers handed in on or **before 4:00 pm, Thursday, April 7**. On the other hand, papers handed in after 4:00 pm, Monday, April 11 but before 4:00 pm on Monday, April 18 will receive a 50% penalty. Papers will not be accepted after this final deadline.

*Normally, students will be required to submit their course essays to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site.*

## MEETINGS

We'll meet for four hours every week: Monday 11:00-1:00 and Wednesday 2:00-4:00. Some of this time will be used on occasion for tutorials (see Blackboard for a schedule). All classes will be held in GE 100.

We have two TAs assigned to this course. The Stata TA will be responsible for Stata questions only. The main TA for the course will grade problem sets and tests, and will also be available for consultation regarding the computer assignments and term papers. Office hours and contact information for both TAs will be posted on our course web site.

My office hours are listed above. They may change to accommodate conflicts or due to other obligations that I have. Announcements will be made through our course web-page available on **Blackboard**.

## EMAIL POLICY

I usually reply to email within one day. But I do not respond to email sent within 24 hours of your test or exam. If your question requires me to write equations or scan computer output, then you should see me during my office hours. To avoid having your email trapped by my spam filter, I encourage you to send me email from your UTOR account. Use the class identifier and a brief description on the subject line [for example, 2408: HAC reference]. There are limits to how much time I can spend answering email, so please don't abuse this privilege. Email should NOT be seen as a means to receive private tutorials or review material that was covered in class but you missed. Also, the TAs are under no obligation to respond to your email, so please limit your questions for them to their the tutorials or office hours.

## PLANNED COVERAGE

The following is a list of the topics and corresponding readings, and anticipated duration of coverage. The core material is covered in the first 5 weeks. We then turn to extensions.

**1. The Nature of Econometrics and Econometric Data** (0.5 weeks).

W: Chapter 1, "The Nature of Econometrics and Econometric Data"
W, EACSPD: Ch 2.

**2. Least Squares and Regression Analysis in the Classical Linear Normal Model**

**A. The simple regression model (in matrix notation)** (1.0 weeks)

W: Chapter 2, "The Simple Regression Model"
: Appendix D "Summary of Matrix Algebra";
: Appendix E "The Linear Regression Model in Matrix Form"

**B. Multiple Regression** (3.5 weeks)

W: Chapter 3, "MRA: Estimation"
DM: Chapter 2,
DM: Chapter 3.1-3.5
W: Chapter 4, "MRA: Inference"
DM: Chapter 4.1-4.4
W: Chapter 5, "MRA: OLS Asymptotics"
DM: Chapter 3.2, 4.5
W, EACSPD: Ch 12.

**3. Extensions for cross-sectional data** (2.5 weeks)

W: Chapter 6, "MRA: Further Issues"
DM: Chapter 3.6
W: Chapter 7, "MRA: Dummy Variables"
W: Chapter 8, "Heteroskedasticity"
DM: 7.1-7.5
W: Chapter 9: "More on Specification and Data Issues"

**4. Time Series Topics** (3.5 weeks)

W: Chapter 10 "Basic Regression Analysis with TS Data"
W: Chapter 11 "Further Issues in Using OLS with TS Data"
DM: Chapter 13
W: Chapter 12 "Serial Correlation and Heteroskedasticity in TS data"
DM: Chapter 14
W: Chapter 18 "Advanced Time Series Topics"

**5. Endogeneity and Simultaneity**. (1.0 weeks)

W: Chapter 15 "Instrumental Variables Estimation and 2SLS"
DM: 8.1-8.7
W: Chapter 16 "Simultaneous Equations Models"
DM: 12.4