ECO 375H
Applied Econometrics I

University of Toronto
Department of Economics

Summer 2011

Course Description

This is an introductory course in applied econometrics. The objective is to provide students with a solid theoretical and practical foundation for the interpretation of empirical evidence in economics. As such there is a dual focus on econometric theory and "hands-on" experience working with economic data. The centrepiece of the course is the multiple regression model. Statistical assumptions, theory, and results are carefully developed, as are the necessary conditions for the valid application of regression analysis to economic data. Throughout the course we spend considerable time on the problem of "causality," and study empirical strategies, such as "quasi-experiments" and Instrumental Variables, that can be used to identify causal relationships. Students will complete a short written empirical project (term paper) that provides experience in the use of econometric methods, as well as the interpretation of regression results.

Instructor

Instructor:	Professor Dwayne Benjamin
Email:	dwayne.benjamin@utoronto.ca
Office hours:	Mondays and Wednesdays, 3:00 to 4:00 (by appointment only). Appointments can easily be made through: https://my.timedriver.com/KBFN2
Office:	150 St. George Street, #168
TA:	Josh Lewis (joshua.lewis@utoronto.ca)

Prerequisites

Students must have the following prerequisites, as listed in the Calendar, to take this course:

Microeconomics:	ECO200Y/204Y/206Y
Statistics:	ECO227Y or ECO220Y(70%) or STA257H + STA261H
Recommended Prep.:	Calculus and linear algebra (MAT235Y/237Y/ECO210H + MAT223H/MAT240H)
Exclusion:	ECO374H, STA302H

This course assumes that students have a background in mathematical statistics. Courses like ECO227Y or the STA257/261 combination provide perfect background in this regard, though probably at a higher

level than necessary. ECO220Y also provides a suitable background, though the mathematical level and orientation of ECO375H is probably a discrete step from ECO220Y. On the other hand, students will benefit from having had the applied focus and economics in ECO220Y. Students who feel they need to bolster their stats background may consult the appendices of the textbook. While the course is mathematical, we make occasional (though limited) use of calculus and linear algebra. Students with weak math backgrounds will especially benefit by taking the recommended math courses.

That all said, note that this is an *economics* course. We frequently use examples from micro- and macro-economic theory. This includes the assigned topics that form the core of the term paper. Accordingly, I assume proficiency in *at least* intermediate microeconomics (ECO 200Y/204Y/206Y).

The Department of Economics takes prerequisites very seriously. They are checked, and students will be removed from the course list if prerequisites are not met.

Textbook

Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, Fourth Edition, 2009, South-Western / Cengage Learning.

This is available at the Textbook Store, or can be purchased from various online bookstores. If you purchase a used edition, you should note that you will still have to purchase a separate (new) license to access the online content associated with the book (e.g., data for problem sets; online study guide; etc.). All references in this course will be to the fourth edition.

Software

The course involves a considerable amount of computing, and students must learn and use a sophisticated statistical software package. STATA is highly recommended, and is the ***only*** package that will be supported by the instructor and TA.

Students should purchase **STATA/IC 11**, available online at:
http://www.stata.com/order/new/edu/gradplans/cgpcampus-order.html

Unless you are planning to use STATA in the future (e.g., in ECO376S), a six month license will be sufficient). "Small Stata" is unlikely to suffice.

After orders are placed online, you will pick up your software at the Software Licensing Office in the Information Commons at Robarts Library:
http://www.utoronto.ca/ic/software/detail/stata.html

While it is ***NOT supported in any way*** by the instructor or TA, students interested in a more cumbersome, but otherwise excellent low-cost (i.e., "free") alternative to STATA may consider "gretl":
http://gretl.sourceforge.net/

Website

The course website (on Blackboard) is accessible through the public course webpage:

http://homes.chass.utoronto.ca/~benjamin/ECO375F-2011.html

The Blackboard website is an important means by which I make announcements to the class, as well as distribute problem sets, the accompanying data, outlines of the lectures, etc. We will be using Blackboard to manage the course website and class communications. It is important that you regularly check the announcements posted there.

Email Policy

The course works best when there is interaction between faculty and students. To this end, I have scheduled two hours per week of office hours. In order to meet with me, you need to make an appointment no later than the day before:

It is extremely simple to make an appointment through this link:
https://my.timedriver.com/KBFN2

In addition, the TA (Josh Lewis) will be available for two hours per week. Combined, students thus have four hours per week for one-on-one discussion with me or the TA concerning course materials.

Where does email fit in? My experience is that email is **not** the appropriate forum for discussing details of econometrics or interpretation of regression output – that is why we have set aside office hours. That said, email can be helpful on occasion, and within limits.

Accordingly, I will endeavour to reply to email within 24 hours, except on weekends, with the following provisions:

- The question should require a one (or two) sentence response (maximum). If it takes more, office hours are the more appropriate venue;
- I will never answer questions concerning STATA (or computing more generally). Such questions should be directed towards the TA. That said, Josh is not the "Stata help line." Students should Stata's own resources (or Google) to answer software questions.
- I will never answer emails that request information that can be found on the website or the syllabus;
- I will not reply to emails concerning grading. For such matters, office hours are more appropriate.
- It is also (strongly) preferable that you use a "utoronto" email address: My spam filter is set to maximum. Moreover, university policy stipulates a preference for these email addresses.
- Always identify yourself in your email;
- Please do not send attachments of any kind;
- Please do not submit term work by email;

I should note, however, that I encourage you to provide course feedback and comments via email, if you wish.

Evaluation

The final grade is based on the following:

Task	Weight	Due Date
Mid-Term Exam	25%	Monday, June 6th, 2011 (4:00 to 6:00)
Term Paper	40%	Tuesday, June 22nd, 2011 (6:00pm)
Final Exam	35%	Tuesday, June 28th, 2011 (4:00 to 6:00)

Mid-Term Exam: will be held on the Monday, June 6th during class time (4:00-6:00), at a location to be announced later.

- Questions will be short-answer or multiple-choice (probably short answer);

- A grade of zero will be given to students who do not write the test, unless an **appropriate and convincing** note is received **within one week** of the missed test (explaining why the test was missed).
    - The note must be provided using the University of Toronto medical certificate. No other documentation will be accepted. You can find a copy of the form here: http://www.healthservice.utoronto.ca/pdfs/medcert.htm
    - The form must be completed by a Medical Doctor, and include the doctor's OHIP registration number.
    - Only original notes will be accepted. I will not accept photocopies or emailed certificates.
    - The note must clearly state that on the date of the test, the student was too sick to write the test. Illness before the test is not sufficient grounds for missing the test. Nor will I accept notes that indicate that the student would have performed "sub-optimally."
    - To comply with these requirements, it is expected that the student will have met with the doctor on the date of the test.
    - **The student must email me the day of the test to indicate that they will not be able to write the test.**
    - I will review each sick note to determine whether there are sufficient grounds for a student to be excused from a test. Part of this review process may include meeting with the student, and/or following up with the physician.
    - It is an academic offence to feign illness to avoid a test.

- If a student has been excused from the mid-term exam on medical grounds, he or she will be permitted to write the make-up test. The make-up test will be held on **Tuesday June 14th, 2:00-4:00**. The test will also be 2 hours, and will have a short answer or multiple-choice framework. It may not be the same format as the mid-term test itself.
    - **NB**: Consistent with university policy, there is no "make-up" test for the make-up test. No medical excuses will be accepted, and grade of zero will be applied if a student fails to write the make-up test.
    - Note also that the make-up test is AFTER the drop date (June 13th).

- For any test, if a students wishes to appeal a grade, he/she must provide a **written explanation** of why they believe their grade is mistaken, and submit it to me *within one week of the test being returned to the class*. Note that the entire test will likely be re-graded, and the appealed grade can be lower or higher than the original grade.

Term Paper: In order to develop skills in using econometric methods, interpreting and discussing empirical evidence in economics, students must complete a short term paper.

- Details will be announced early in the semester, but the basic idea is that students will be provided data and assigned a question based on those data (e.g., similar to the textbook computer problems).
- Students will have no choice over the topic, but will be randomly assigned one of several possible topics.
- The papers are expected to be six pages in length (double spaced), plus tables.
- Concerning late penalties, assignments handed in after 6:00pm June 22nd will be penalized by 10 percentage points per business day. I will not accept papers after 4:00 pm on June 28th.
- Extensions to the deadline for the term paper will not be granted for any reason.

A note about plagiarism: Plagiarism is a very serious problem. There will be more details concerning the definition of plagiarism, advice on how to avoid it, and the associated penalties when we discuss the paper assignment in more detail. The term paper must be submitted for review through www.turnitin.com. Instructions will be provided along with the details to the assignment.

It is important to underscore that the Department of Economics prosecutes all cases of plagiarism vigorously. This includes "unintentional" plagiarism. Ignorance of the rules of plagiarism is specifically excluded as a defence.

University disclaimer concerning Turnitin.com:

"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."

Problem Sets: Problem sets will be assigned throughout the course, and form the basis of the tutorials. They will be comprised of both theoretical and computer- (data-) based problems. The problems sets will not be graded, but serve to prepare students for the graded components of the course (mid-term, term paper, and final exam).

Meetings

- Lectures are held Mondays and Wednesdays from 4:00-6:00. The Tuesday 4:00-6:00 time slot is used for tutorials, as well as occasional lectures. All scheduled class-time (MTW, 4:00-6:00) is going to be used. Even though PowerPoint outlines of the lectures are posted online, it is a terrible idea to skip lectures: The posted slides are a long way from being a transcript of the lecture. I will usually post a PDF file of the slides the day before the lecture.
- Regularly scheduled tutorials are used mainly for discussing problem sets. We will also schedule a few additional tutorials outside this time slot to introduce STATA, and discuss the term paper.

Planned Coverage

The following is a list of the topics we shall cover, with the associated readings. The projected pace is noted in parentheses, but subject to change. We begin with the multiple regression model under "ideal conditions," using cross-section data. We then turn to the identification of causal relationships, and an introduction to instrumental variables.

1. *Introduction to econometrics* (1 lecture)
   - Wooldridge, Chapter 1

2. *Brief review of statistics* (1 tutorial slot)
   - Wooldridge, Appendix C
   - Students should review Appendix B (Probability Theory) prior to this. We will not be reviewing this material in class.

3. *The simple regression model* (1 lecture)
   - Wooldridge, Chapter 2

4. *Multiple regression under ideal conditions* (5 lectures)
   - Wooldridge, Chapters 3, 4, 5, 6 (6.1, 6.2, 6.3), 7, and 8 (8.1, 8.2)
   - Wooldridge, Possibly parts of Appendices D and E

5. *Causality, Experiments, and Quasi-Experiments* (2 lectures)
   - Mostly, not in the textbook.
   - Some material in Wooldridge, Chapter 13.2 ("differences-in-differences")

6. *Instrumental Variables* (3 lectures)
   - Wooldridge, Chapters 15 and 9.4 (measurement error)

Calendar and Planned Coverage

Monday	Tuesday	Wednesday
May 16 ***Lecture 1: Introduction*** Wooldridge, Ch. 1	**May 17** ***Statistics "Review"*** Wooldridge, Appendix C	**May 18** ***Lecture 2: Simple Regression*** Wooldridge, Ch. 2
May 23 Victoria Day: No Classes	**May 24** ***Lecture 3: Multiple Regression I*** Wooldridge, Ch. 3	**May 25** ***Lecture 4: Multiple Regression II*** Wooldridge, Ch. 3 (and 5)
May 30 ***Lecture 5: Multiple Regression III*** Wooldridge, Ch. 4 (and 5)	**May 31** **[Tutorial I]** Problem Set 1	**June 1** ***Lecture 6: Multiple Regression IV*** Wooldridge, Ch. 6.1, 6.2, 6.3, 8.1, 8.2
June 6 **[Midterm Exam]**	**June 7** ***Lecture 7: Dummy Variables*** Wooldridge, Ch. 7	**June 8** ***Lecture 8: Causality and Experiments***
June 13 (Drop Date) ***Lecture 9: Quasi-Experiments*** Wooldridge, Ch. 13.2	**June 14** **[Tutorial II]** Problem Set 2	**June 15** ***Lecture 10: Instrumental Variables I*** Wooldridge Ch. 15, 9.4
June 20 ***Lecture 11: Instrumental Variables II*** Wooldridge Ch. 15	**June 22** ***Lecture 12: Instrumental Variables III*** Wooldridge Ch. 15 **[Term Paper Due]**	**June 23** **[Tutorial III]** Problem Set 3
June 27	**June 28** **[Final Exam, 4:00-6:00]**	**June 29**