Course description and objectives

The course aims to introduce students to the use of econometric methods, to give them an appreciation of their scope and their usefulness in securing identification of economic magnitudes, and to give them an understanding of the properties of a variety of econometric procedures in relatively simple settings.

On completing this course students should have an appreciation of the purpose of econometric analysis and a sufficient awareness of basic econometric techniques to be able to understand the presentation of basic econometric results in academic articles and professional reports and to critically appraise their usefulness and appropriateness. The course assumes that students have taken ECON 337.

Administrative Issues

3 credits. 2 lectures per week: Monday and Wednesday 4:05pm-5:25pm in BURN 1B45.

Contact:
Office hours: Tuesday, 10:30 to 11:30am in Leacock 320. You should preferably come during office hours. If this is not possible, you can meet on a different day.
email: mayssun.el-attarvilalta@mcgill.ca

Textbooks: The main content of the course will be developed in the lectures. Slides will be made available after each topic has been covered. The following textbooks are useful:

- Wooldridge, J.M. (2013), *Introductory Econometrics: A Modern Approach* 7th Edition, South-Western Cengage Learning, Mason. (This will be the main textbook for the course. It provides a practical approach to econometrics, and shows how the tools of econometrics are used to address real questions in policy analysis and other areas.)

• Angrist J. D. and Pischke J.F. (2015), *Mastering ‘metrics: The path from cause to effect.* (This book covers key econometric tools for policy analysis using up to date, real-world examples. It is rigorous but easy to read, and uses only elementary statistics.)

• Cameron A.C. and Trivedi P.K. (2010), *Microeconometrics Using Stata* Stata Press. (This book integrates the discussion of econometric tools with their implementation in Stata, and provides a useful body of data sets and codes in Stata.)

Other books that could be relevant for isolated elements of the course are:

• Jeffrey Wooldridge, *Econometric Analysis of Cross Section and Panel Data,* The MIT Press, 2002. (The approach is up to date and not overloaded with algebra.)


**Group Assignments:** During the term you will receive four exercise sets. You should attempt to solve all the assignments, some of which may introduce you to additional, related material. One assignment per group should be submitted. The groups should consists of five students. Only two of the assignments will be grades. We will discuss some of the exercises in class or in the conferences and you will have the opportunity to raise questions concerning the exercises. For some of the exercises, you will need to use econometric software like Stata.

**Grading:** Assessment is by a midterm exam in class, a take-home exam, a final exam and two assignments. The midterm exam will take place in class on Wednesday February 26 and will account for 20% of your grade. The take-home exam will consist in a practical exercise where you will have to use stata or another statistical software. It will account for 20% of your grade. The exam will take place during class time, on Monday March 23. The final exam will be a 3-hour exam scheduled by the Faculty of Arts in the exam period in April and will be worth 50% of the grade. Two assignments will be graded and will account for 5% each.

If you cannot do the midterm or the take-home exam for medical reasons, the weight of the missed exam will be moved towards your final exam.

In case of absence at the final exam for medical reasons, please refer to the University Regulations Concerning Final Examinations. Note: According to Senate regulations, instructors are not permitted to make special arrangements for final exams. Please consult the Calendar, section 4.7.2.1, General University Information and Regulations at www.mcgill.ca. Also note: In accord with McGill University’s Charter of Students’ Rights, students in this course have the right to submit in English or in French any written work that is to be graded. Finally: In the event of extraordinary circumstances beyond the University’s control, the content and/or evaluation scheme in this course is subject to change.

**MyCourses:** You should regularly check the myCourses page for announcements, up-to-date information, additional readings, class notes, problem sets and other items to assist you in the course.
**Academic Integrity:** Cheating is bad, everywhere and always. It is your responsibility to understand what is meant by “cheating” at McGill, and thus what behaviour is unacceptable. I am required to have the following statement on the course outline, in both official languages:

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the code of student conduct and disciplinary procedures (see http://www.mcgill.ca/integrity/ for more information).

L’université McGill attache une haute importance à l’honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l’on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l’étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site http://www.mcgill.ca/integrity).

**Course Outline**

Due to time constraints, it is possible that some topics will not be covered or some topics added. I maintain discretion regarding changes in this outline. Any changes will be announced in class and/or on MyCourses.

1. **Introduction**
   - Steps in Empirical Analysis
   - Causality and the Notion of Ceteris Paribus
   - Randomized Trials

2. **Classical Regression Model (Review).**

3. **OLS failures:** heteroskedasticity, autocorrelation, clustering and multicollinearity (Review).

4. **OLS failures:** endogeneity.
   - Failure of the orthogonality conditions and consequences.
   - Causes of failure: omitted variables, measurement error, reverse causality.
   - Estimation:
     - Instrumental variables.
     - Two stage least squares.
     - Introduction to simultaneous equations.

5. **LATE interpretation of IV.**
6. Introduction to panel data:
   • Random Effects and Fixed Effects models.
   • Difference in Difference.
   • Dynamic panel data models.

7. Maximum likelihood and discrete choice models:
   • LPM, logit and probit.
   • Conditional logit and multinomial logit.
   • Ordered probit.

8. Regression Discontinuity Design