

Version: 26 Aug 2019

ECON 4G03/6G03: ECONOMETRICS II

Fall 2019

Instructor: Arthur Sweetman **Email:** arthur.sweetman@mcmaster.ca
Office : KTH 407

Office Hours: During computer lab; or by appointment

Lecture: Tues. 11:30am-12:20pm, LRW-5012; Thurs. 11:30am-1:20pm, KTH-107

Laboratory: Tues. 9:30-11:30pm; LRW-5012

TA: tba **Email:** tba
Office: tba **Office Hours:** tba

COURSE DESCRIPTION

Development of regression models appropriate to economics. Illustrations from applied micro- and macroeconomics.

PREREQUISITES

ECON 2G03 or 2X03; and ECON 2H03; and at least B- in ECON 3EE3 (formerly 3WW3) or ECON 3E03 (formerly 3U03) or another course that is approved by a departmental counselor.

COURSE OBJECTIVES

Quantitative analysis is fundamental to the practice of economics and many other academic disciplines, and it is important for many professional careers. This course, therefore, assumes that understanding both econometric theory and practice is crucial for those pursuing careers in economics and similar professions, and as preparation for graduate work/research. Three pedagogical assumptions are made:

- the best way to learn econometrics is to do econometrics and this implies writing computer code appropriate for statistical software,
- it is natural for learn from specific examples/illustrations and then to generalize, and
- students already have a basic knowledge of the material taught in Econ 2B03 and Econ 3EE3, or equivalent.

Material in this course is cumulative, so if you feel like you are getting a little lost, please seek assistance right away. Studying with classmates is usually advantageous, but make sure you understand the material yourself.

Initially we will briefly review selected background material from earlier courses. Chapters 2 and 3 review introductory probability and statistics, as seen in Econ 2B03 and equivalents, and chapters 4 to 9 cover the same material (more or less) as Econometrics I, as seen in Econ 3EE3 and equivalent. This material is foundational and we cannot pursue the more advanced topics in this course without a solid understanding of these basics, hence we undertake a lengthy review. After the review, the majority of the course combines the application-oriented

chapters in the second half of the book (chapters 10-15; omitting chapters 16 and 17) and addresses the theoretical chapters as time permits (chapters 18 and 19).

CLASS FORMAT

Three hours per week of lecture and two hours per week of computer laboratory work.

Computer Laboratory

Many of the assignments and laboratory periods will involve using the statistical software Stata to do simulation or applied analyses; receiving some instruction and asking questions can make getting to know the software much easier and students more productive. Therefore, in addition to the 3 classroom hours per week, this course has a mandatory computer laboratory period. Some laboratory periods will be used for lecture/demonstrations and well as for students to start work on their assignments. Many of the generic coding skills addressed are transferable to other statistical software.

COURSE MATERIALS AND TEXTS

- REQUIRED TEXT: *Introduction to Econometrics, 4th ed.* by James H. Stock and Mark W. Watson (Published by Pearson Addison Wesley).

Available at the McMaster bookstore and elsewhere.

I'd suggest reviewing the "Key Concepts" for chapters 1 thru 9 that are listed on the latter pages after the full tables of contents.

- Website for the 4th edition (this is free and an excellent resource):
https://www.princeton.edu/~mwatson/Stock-Watson_4E/Stock-Watson-Resources-4e.html.
The 4th edition is new and at the time of writing this website is not "pretty", but I think all the material is there.
- Website for updated 3rd edition of the textbook (this is also free and an excellent resource):
https://wps.pearsoned.com/aw_stock_ie_3/178/45691/11696965.cw/index.html

Among other features, both textbook websites contain datasets, practice questions (with solutions), solutions to selected end-of-chapter questions, and tutorials for econometric software including Stata, which we will use in class

- Econometric Software
There are a number of data management and/or statistical/econometric software packages that are available. For my classroom demonstrations I will use Stata (www.stata.com) and the assignments require Stata to be used; it is one of the packages commonly used by economists. Although purchasing Stata is not required for this course since Stata is available in the student computer labs, student pricing for annual and perpetual licenses can be found at: <http://www.stata.com/order/new/edu/gradplans/campus-gradplan/>. Stata has

“flavours”: IC, SE, MP. Any of them will be able to do all of the work for the course and there is no need for anything beyond the smallest – indeed, there is no need to buy anything at all.

Stata also has a YouTube channel and various free online/computer based tutorials/webinars that students may want to consult if not for this course then for their future econometric work (www.stata.com & <https://www.youtube.com/user/StataCorp>). In fact, students are likely to find some of these videos very helpful, but be aware that there are many videos on a range of topics not relevant to this course (& some are pretty slow moving). A number of universities have excellent support material for Stata, such as that at UCLA: <https://stats.idre.ucla.edu/stata/>.

The full set of Stata V16 documentation is (i.e., the manuals are) available (for free) online: <http://www.stata-press.com/manuals/documentation-set/>. PDFs of manuals for the version in the student labs can be found through the Stata software.

Beyond the “base” software sold by “Stata Inc.”, many users contribute open source code that is available on the web (indeed, much of the base Stata package is open source). One location for code for Stata and other econometrics/statistical programs is: <https://ideas.repec.org/i/c.html>. Of particular relevance for Stata is: <https://ideas.repec.org/s/boc/bocode.html>.

- If you have never used Stata, and maybe even if you have, you may find the following books useful; they also address many issues in econometrics. All are on reserve in the library.

- 1) *A gentle introduction to Stata 4th ed.* (2014) by Alan C Acock (HA 32 .A26 2014).

A more advanced book that students have found helpful in the past, especially the first two chapters for an introduction to Stata, is:

- 2) *Microeconometrics Using Stata* by A. Colin Cameron and Pravin K. Trivedi (HB 139 .C36 2010).

Finally, a good primer on time series is:

- 3) *Introduction to Time Series Using Stata* by Sean Beckett (QA 280 .B42 2013).

A number of books that you may find helpful are also on reserve in the library.

AVENUE TO LEARN

This web-based software will be a key communications tool for the course and will be used to disseminate information, assignments and the like. Please see <http://avenue.mcmaster.ca/>.

Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

COURSE EVALUATION – OVERVIEW

1. 5 Assignment worth 5% each
2. 2 Midterm tests worth 15% each
3. Final Exam worth 45%

COURSE EVALUATION – DETAILS

Assignments (5@5% = 25% total)

Each assignment will be posted on Avenue. These due dates are tentative. I view university as preparation for life beyond graduation, therefore for all assignments neatness, presentation, grammar and spelling contribute to the grade.

Assignment/test 1 (5%)

Assignment/test 2 (5%)

Assignment/test 3 (5%)

Assignment/test 4 (5%)

Assignment/test 5 (5%)

Submission of Assignments

Unless otherwise announced, assignments are due at the beginning of class or lab on the due date, and must be on paper with the pages neatly stapled together and identified with the student's name and student number.

Midterm and Final Exam Information

Only the Casio FX series calculator (McMaster Standard Calculator) may be used for tests and the exam. You may be asked to answer multiple choice questions on scan sheets; you must use an HB pencil to fill in these sheets and you are responsible for bringing one to the Term Tests and Final Exam.

Midterm Tests (2@15% = 30% total)

They may comprise both multiple choice and/or short answer questions (although in recent years I have not employed multiple choice); some questions may require you to sketch a graph and/or to perform mathematical calculations. You should bring an appropriate calculator (see below) and a short ruler. The dates for the midterm tests will be announced in class and/or posted on Avenue; tentative dates are on the schedule in this outline. Midterm tests may be in the class or lab portions of the course.

These test dates are tentative.

Midterm Test 1 (15%), on Oct. 3

Midterm Test 1 (15%), on Nov. 14

Final Exam (45%) scheduled by the Registrar's office

The final examination will cover material from the entire course, but the emphasis is on the later material in the course. It may comprise both multiple choice and short answer questions; some questions may require you to sketch a graph to illustrate your ideas and/or to perform mathematical calculations. You should bring an appropriate calculator and a short ruler. The final exam time and location is determined by the registrar's office will be posted by that office.

COURSE POLICIES

Grades will be based on the McMaster University undergraduate grading scale:

MARK	GRADE
90-100	A+
85-90	A
80-84	A-
77-79	B+
73-76	B
70-72	B-
67-69	C+
63-66	C
60-62	C-
57-59	D+
53-56	D
50-52	D-
0-49	F

Important note for those registered in Econ 6G03

The passing grades for a Master's or Doctoral course are A+, A, A-, B+, B, and B-.

Absences, Missed Work, and Illness for assignments, midterm tests and the final exam, and the McMaster Student Absence Form (MSAF)

All absences from the midterm test and final exam, and missed assignments, are subject to the appropriate university policies and processes. Unless a large number of absences have occurred, the self-reporting form is normally applicable for midterm tests and assignments.

Should you have an absence and miss any academic work, students should normally see <https://www.mcmaster.ca/msaf/> for information on how to proceed.

Late Assignments

Unless there is a valid (e.g. medical) excuse, late assignments will be given a penalty of 10% per class and assignments will not be accepted more than one class late; missed assignments will be given a grade of zero. Assignments that are late with appropriate justification are due at the earliest subsequent feasible date.

Missed Midterm Tests

Missed tests are **not** automatically prorated onto the final exam. Students are advised not to miss tests without good/valid reason. A grade of zero will be assigned in the case of a missed assignment or midterm absence without an appropriate justification. Students who miss a midterm test for a valid reason are normally expected to write a makeup test as soon as is feasible after the missed test. A common makeup midterm test and date will be set for all relevant individuals (unless there is an ongoing justified excuse); it will be outside of class time and may be in the day or evening (or if required on a weekend), although efforts will be made to schedule it on a weekday.

Missed Final Exam

Final exams are managed by the Registrar's Office and are not under the control of the instructor. Should you miss the final exam for a valid reason you will need to provide documentation to your Faculty Office in your request for a deferred examination. If approved, the timing of the makeup for the final exam will be set by the Registrar's Office.

Where to Get Help regarding course material

Contact the instructor.

Calculators and iClickers

Only the Casio FX series calculator (McMaster Standard Calculator) may be used for tests and the final exam. No iClickers are used in this class.

UNIVERSITY POLICIES

Academic Integrity Statement

You are expected to exhibit honesty and use ethical behavior in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behavior can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the [Academic Integrity Policy](#).

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one's own or for which credit has been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations.

Academic Accommodation of Students with Disabilities

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements. Academic accommodations must be arranged before classes or academic work begins, and for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail sas@mcmaster.ca. For further information, consult McMaster University's Policy for [Academic Accommodation of Students with Disabilities](#).

Academic Accommodation for Religious, Indigenous and Spiritual Observances

Students who require academic accommodation due to an Observance must submit a RISO form to their Faculty office, electronically or in person, normally within ten working days from the beginning of each term in which they are anticipating a need for Accommodation. For further information, consult McMaster University's [Policy on Academic Accommodation for Religious, Indigenous and Spiritual Observances](#).

Faculty of Social Sciences E-mail Communication Policy

Effective September 1, 2010, it is the policy of the Faculty of Social Sciences that all e-mail communication sent from students to instructors (including TAs), and from students to staff, must originate from the student's own McMaster University e-mail account. This policy protects confidentiality and confirms the identity of the student. It is the student's responsibility to ensure that communication is sent to the university from a McMaster account. If an instructor becomes aware that a communication has come from an alternate address, the instructor may not reply at his or her discretion.

Course Modification

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check his/her McMaster email and course websites weekly during the term and to note any changes.

Requests for Relief for Missed Academic Term Work McMaster Student Absence Form (MSAF)

In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar "Requests for Relief for Missed Academic Term Work".

Extreme Circumstances

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.

WEEKLY COURSE SCHEDULE AND IMPORTANT DATES

NOTE: It is possible that some classes and/or laboratory periods will need to be rescheduled away from their normal time slots to accommodate special events such as department guest speakers. Effort will be made consult and accommodate students in selecting alternative time slots in this eventuality.

Warning: The schedule should be viewed as tentative and may be adjusted as the term progresses depending upon class progress. **It is the responsibility of the student to listen for announcements in class and to check his/her McMaster email and Avenue To Learn weekly during the term and to note any changes.** Please give me any feedback that you think will be helpful.

One of the elements of a university education is that students learn how to learn on their own. Selected readings from the text will, therefore, be assigned during the term but not discussed in class. Students are responsible for this material on the assignments, midterm tests and final exam.

Week 1 (Week of Sept. 1 – first class Sept. 3)

Review

Readings: Part 1 (Probability and Statistics) See list of “Key Concepts” adjacent to the table of contents; review each key concept and if required the associated material in the text.

Notes: Computer lab this week focuses on an introduction to Stata. Optional for those already familiar with Stata.

Week 2 (Week of Sept. 8)

Review

Readings: Part 2 (Fundamentals of Ordinary Least Squares Regression) “Key Concepts” listed introductory pages.

Note: Prior to the lab, start learning Stata on your own; esp., see the Stata tutorial at https://www.princeton.edu/~mwatson/Stock-Watson_4E/Stock-Watson-Resources-4e.html or https://wps.pearsoned.com/aw_stock_ie_3/178/45691/11696965.cw/index.html, and the books on reserve in the library (esp., the first two chapters of the Cameron & Trivedi book, and the “Gentle Introduction” book for a more extensive introduction). An introduction to Stata will also be provided in the first lab, but two hours are insufficient and you will need to do some learning on your own.

Week 3 (Week of Sept. 15)

Review

Readings: Review material from the previous 2 weeks to ensure integrated comprehension. (Perhaps start chap. 10.)

Week 4 (Week of Sept. 22)

Regression with Panel Data

Readings: Chapter 10

Week 5 (Week of Sept. 29)

Regression with Panel Data / Regression with a Binary Dependent Variable

Readings: Chapters 10/11

Note: Midterm test 1: Oct. 3.

Week 6 (Week of Oct. 6)

Regression with a Binary Dependent Variable / Instrumental Variables Regression

Readings: Chapters 11/12

Week 7 (Week of Oct. 13)

Reading Week: No Class

Week 8 (Week of Oct. 20)

Instrumental Variables Regression

Readings: Chapter 12

Week 9 (Week of Oct. 27)

Experiments and Quasi-Experiments

Readings: Chapter 13

Week 10 (Week of Nov. 3)

Prediction with Many Regressors and Big Data

Readings: Chapter 14

Week 11 (Week of Nov. 10)

Introduction to Time Series Regression and Forecasting

Readings: Chapters 15

Note: Midterm 2, Nov 14

Week 12 (Week of Nov. 17)

Introduction to Time Series Regression and Forecasting

The Theory of Linear Regression with One Regressor (If short on time, focus on Weighted Least Squares; section 18.5)

Readings: Chapters 15 and 18

Week 13 (Week of Nov. 24)

The Theory of Linear Regression with One Regressor /

The Theory of Multiple Regression (If short on time, focus on matrix notation/specification and Generalized Least Squares; sections 19.1, start of 19.4 and 19.6)

Readings: Chapters 18/19

Week 14 (Week of Dec. 1 – last class Dec. 3)

The Theory of Multiple Regression

Readings: Chapter 19

Notes: This lab period will be used for review and questions, and/or to catch up if we are behind schedule.