

ECO220Y1 Introduction to Data Analysis and Applied Econometrics

Sections L0201 and L5101 – Instructor : Patrick Blanchenay

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Key Information

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L0101	Mondays 14.10-16.00, in MP102*	Tuesdays 16.10-18pm in MP102 and SS2117
L0501	Mondays 11.10-13.00, in SS2117*	

* You may attend either, see Lectures.

Course site: Quercus (all announcements and material)

Course calendar

Piazza:

<https://piazza.com/utoronto.ca/fall2019/eco220yblanchenay/home>

Communication: see Communication below

Office hours (drop-in): Tuesdays 12.30-14.30 in room GE 348 (150 St-George st); rescheduling on Quercus.

Head TA: TBC

Economics Study Centre (GE 110): open daily (drop-in), 150 St George, main floor

Description

ECO220Y Introduction to Data Analysis and Applied Econometrics is an intermediate level course in quantitative methods for students at the University of Toronto (St-George campus). Are houses getting more expensive? Can we say that richer countries are happier? Do people give more to charities if it costs them less? These are all empirical questions: answering them requires to understand and analyze data. This course is designed to equip you with the foundational tools necessary to apprehend and think in a structured way about data, as an economist and as a citizen. You will review basic statistics and use it to summarize data, learn about random variables (how we often think about processes that generates the data we see in real life), learn how to test a hypothesis or compare groups using data, and learn how to uncover relationships between variables using one of the most important tools in econometrics: regressions. In a nutshell, you will learn how to analyze data, to know what it says and what it doesn't.

The course relies on weekly lectures and tutorials, as well as homeworks and term tests. It is supplemented by the [Data Analysis Course Module \(DACM\)](#), which will provide hands-on applications of data analysis using Microsoft Excel.

Course Prerequisites

The Economics Department strictly enforces its [prerequisites policy](#). An administrator will remove anyone missing prerequisites: <https://fas.calendar.utoronto.ca/course/ECO220Y1>. *I cannot waive prerequisites.*

Learning Outcomes

1. Translate between plain English and statistical terms and concepts: identify key information regardless of wording and distinguish incorrect statements from correct ones.
2. Select and apply a suitable quantitative approach to a new situation while making your reasoning clear: may require sentences, precise statements of hypotheses, equations, calculations, fully-labeled graphs, diagrams.
3. Proficiently read output from various statistical software packages including STATA.
4. Use Excel to analyze data and replicate published results.
5. Correctly interpret quantitative results for a non-technical or technical audience.
6. Draw valid statistical conclusions and steer clear of common pitfalls.
7. Explain what would change if a researcher made different choices or the data changed.
8. Identify the underlying assumptions in quantitative analyses and figure out how violations affect conclusions and interpretations.
9. Read and critically evaluate analyses without being dazzled by data, methods or jargon.
10. Effectively apply course concepts to a wide range of contexts from popular press articles to papers in peer-reviewed academic journals.
11. Assess available data or propose a data collection plan to address a research question.
12. Craft concise, clear, and coherent written arguments that directly answer asked questions.

Required: readings, textbook, iClicker remote

Our course includes significant [required readings](#). These include important supplements available to you (at no charge) on Quercus. Details are provided in the [course calendar](#).

The **required** textbook is 2017 [Business Statistics, Third Canadian Edition](#), Published 2018 by Sharpe, De Veaux, Velleman, and Wright. Used copies from 2017/18, 2018/19, Summers 2018 and 2019 are around. The Economics

Study Centre has it. Old editions are inconvenient. You may also decide to purchase an electronic-only version of the textbook (e-text). It is usually cheaper than the paper version but it cannot be resold.

The textbook has its own online portal, that features extra exercises and extra materials, such as videos, etc. Access to the online portal is **not required** for the course; some of you may however find it valuable. An access code can be purchased together with the textbook or purchased separately on <http://www.mystatlab.com>; if you use the online portal, you will need to supply our course code **instructo69137**.

Also **required** is an iClicker remote, to record your lecture participation, see [iClicker class participation](#).

Resources

Lectures

The course is built on weekly lectures (see [course calendar](#)); attendance is mandatory and is graded via [iClicker participation](#). Each week there are two lecture sessions: Mondays 11.10-13.00, in SS2117 and Mondays 14.10-16.00, in MP102. You may attend either of these, regardless of what section you are registered in. If attendance gets uneven over time, I will ask you to attend the session you are registered for.

Before each lecture, you are expected to do the required readings. Readings will usually be taken from the textbook + a handout, but may occasionally come from additional sources. Slides for the lecture are posted in advance; there will often be an additional handout. **Slide are NOT lecture notes** and often have blank areas. You are expected to take notes.

There are 3 reasons why I ban laptops and electronic devices during lectures (even if you use the e-text):

- Laptops encourage you to write too much down instead of actively listening and synthesizing (active content processing): students who use laptops [retain less content](#), and [perform less well on tests](#).
- Laptops offer scope for distraction, [not only for you but also for your classmates](#).
- Having an engaged audience (instead of faces staring at screens) also increases the quality of my teaching.

Taking notes (with pen & paper) increases your chances of performing well in this course.¹ If you do need to use a laptop or device for academic reasons, please inform me by email before the first class (see [Email](#) section.); in such case, I would appreciate if you could position yourself in class in a way that your laptop's screen will not distract others, perhaps in the back, or at the end of a row.

Tutorial slots (Tuesdays)

The Tuesdays (16.00-18.00) slots are used either for DACM tutorial, course tutorial, or midterm tests.

The Data Analysis Course Module (DACM) is required for all sections. It runs from September through April. You will dive into real data and research and replicate key findings. There are five modules (A through E) and five online quizzes. DACM appears as another course for you on Quercus: that [DACM Quercus site](#) has all DACM materials, including the [DACM Handbook](#) and DACM syllabus. Check the [DACM Handbook](#) for the exact dates of DACM tutorials. You are free to choose which section to attend; if attendance gets unbalanced I will manually assign students.

¹This great *Economic View* column by Susan Dynarski points out to some of the recent research: "[Laptops Are Great. But Not During a Lecture or a Meeting.](#)" *New York Times*, 2017-11-22. Some of the research she mentions are listed [here](#).

On weeks where there are no DACM tutorials, the tutorial slot will be used either as a group work session or as a TA aid centre. Handouts and more information will be posted on Quercus.

Office hours and TA Aid Centres

Instructor drop-in office hours: every week during term time, Tuesdays 12.30-14.30 in GE 348 (150 St George street). In addition, there will be TA office hours and TA Aid Centres scheduled in more intense periods of the year (for instance before midterm tests).

Economics Study Centre: Open Daily, 150 St George

The [Economics Study Centre](#) supports ECO220. Peer mentors at the ESC are undergraduates who have done very well in their ECO courses, including ECO220. You can ask questions to students who have been in your shoes in the past. The ESC is open to all undergraduate Economics and Rotman Commerce students. It operates as a drop-in centre, you do not need to book an appointment. This is an invaluable resource and I really encourage you to use it.

Evaluation

Evaluation for the course will be a mix of tests, and the final exam. The final course grade will be rounded to the nearest integer, with no exception.

Evaluation	Date	Percentage of final grade
Midterm test 1	Tues 8 Oct 2019, 16.10-18.00	13%
Midterm test 2	Tues 26 Nov 2019, 16.10-18.00	13%
Midterm test 3	Tues 14 Jan 2020, 16.10-18.00	13%
Midterm test 4	Tues 3 March 2020, 16.10-18.00	13%
Open make-up test	Tues 31 March 2020, 16.10-18.00	<i>replaces lowest midterm</i>
Lecture participation (iClicker)	<i>year-long, see course calendar</i>	10%
Data Excel Course Module (5 online quizzes tests)	<i>year-long, see dedicated Quercus</i>	10%
Final exam	see A&S exam calendar	28%

Midterm Tests and Final Exam (80%)

For all midterm tests and the final exam, bring your TCard, pencils, erasers, and a non-programmable calculator.

All sections of the course write the same cumulative final exam; the midterm tests are specific to each instructor. In all midterm tests and in the final exam, one or more questions (possibly with multiple parts) is planned to require a longer written answer where you interpret and assess quantitative results (e.g. tables, figures, Stata output, etc.). You will be given an aid sheet containing formulas and relevant statistical tables. The aid sheet for the entire course are posted [HERE](#): bring a copy and a calculator to classes and TA tutorials (do not bring a copy to tests or the final exam).

Each midterm test lasts 1h50min; aim to be in the room no later than 10 minutes *before* official start time. You will not be given extra time if you're late.

Tests are scanned and marked using Crowdmark; this means that you can write using pencil and eraser if you prefer. During the test you must show your student ID and sign the "signup sheet". Stay seated until all tests have been collected and counted. To avoid disruption, you cannot leave the room in the last 15 minutes.

Not attending a midterm test will result in an automatic zero for that test. There is an open make-up test; the grade of the open make-up replaces your lowest midterm, but only if you did better on the open make-up test. See section on [Missed Term Work](#).

iClicker class participation (10%)

iClicker questions encourage you to prepare for class, keep engaged during lectures, and identify misunderstandings. Complete readings before class, as some questions will likely refer to readings material.

Like any class participation, quality matters. Correct iClicker responses earn full marks. Incorrect answers earn partial marks. Each unanswered question earns 0 marks. Point values may vary by question. You may attend L0101 or L0501: your iClicker will work.²

It is your responsibility to: correctly register your iClicker, bring it to class, arrive on time, and stay for the entire class. You may collaborate with your classmates: in fact, you are encouraged to discuss.

Every lecture, except Lecture 1, counts for marks. The lowest 3 scores will be dropped. iClicker is not used in tutorials. At the end of the first term, I will post your intermediate iClicker marks on Quercus. At the end of the course, I will post your overall iClicker mark in MyGrades on Quercus.

You may buy a used iClicker, borrow an iClicker or share an iClicker with anyone that is *not* currently taking ECO206 with me. You must use an iClicker remote: iClicker REEF is not permitted. To register (or re-register) go to our Quercus site and follow the link "iClicker Registration" on the left tool bar. If your iClicker's remote ID is no longer legible, see me before or after class (we can use my iClicker base station to read your remote's signal and recover its ID). If obtaining an iClicker remote is a financial hardship, please see me in office hours right away.

A green light illuminates on your iClicker remote when your response is received by an iClicker base: make sure to vote only while voting is active in our class. We use frequency AA. A red light (or no light) indicates a problem. The last answer you press (while voting is still active) is graded. **Nearly all strange remote behavior can be fixed by replacing ALL batteries with brand new ones.**

How can I check if I am earning marks with my iClicker? There are TWO separate requirements: (1) attend class, answer while voting is active, and get a green light and (2) register your remote.

Check (1) during class. To check (2), click "iClicker Registration" in Quercus. Note: Once you register, you will get credit for all earlier participation (i.e. even before you had registered).

What happens if I forget my iClicker? You will earn zero points for that lecture. In all likelihood, the score for that lecture will be one of the 3 lowest scores, and will be dropped.

² If you attend the same lecture twice, only the first mark will count.

You may only enter responses yourself using your own properly registered iClicker. Cheating on any question jeopardizes the entire iClicker Participation mark (10 percent of the course grade). All cases will be reported to the Economics Department and to the Office of Student Academic Integrity. A student that “helps” by operating someone else’s remote can expect an equally harsh penalty.

DACM online quizzes (10%)

There are 5 online quizzes, that will count for 10% of your course final grade. All information concerning DACM marking scheme can be found in Section 2.2 of the [DACM Handbook](#).

Missed Term Work

You are expected to complete all required work as scheduled in the [Evaluation](#) section. The marking scheme already includes multiple accommodations for missed term work.³ An open make-up test taking place on the 31st March accommodates students that cannot write one midterm test due to illness, injury, personal/family problems, or extracurricular conflicts. It also accommodates students who write a test in difficult circumstances and do poorly. (Note: If you are going to be late to a test, you are expected to show up late and see me.) The scheme acknowledges the continuous space of reasons for missing or doing poorly on a test, where most are hard to credibly document or are personal. It puts the responsibility on you to manage your time and life to succeed in the course. **You do not need to provide medical documentation or reasons for missing one term test, or to attend the open make-up test on Tuesday 31 March.**

The 3 lowest scores of your iClicker participation will be dropped automatically; this accommodates for students unable to attend a lecture.

Accommodations for missing more work than already addressed in the previous paragraphs (missing more than one test or more than 3 lectures) are extremely limited: (A) an ongoing and substantial injury, illness, or personal/family problem seriously affecting the student’s ability to complete term work across all courses over an extended period of time, where the student’s College Registrar⁴ writes to each professor after reviewing the documentation and meeting with the student; or (B) more than one conflict not related to injury, illness or personal/family problems where I am contacted by the student *very far in advance* (e.g. an athlete who notifies me in September of international competitions on Nov. 26 and Jan. 9). In these *limited situations*, I will consider whether accommodations can still meet all course requirements or whether the student must be advised to drop the course and retake it when able to complete the required work.⁵

³ This section applies to missed *term* work. Any accommodation for the final examination requires a student to formally petition A&S: see http://www.artsandscience.utoronto.ca/ofr/calendar/Rules_&_Regulations.html

⁴ For ongoing injury, illness, or personal/family problems you must contact your [College Registrar](#) immediately.

⁵ Any extraordinary accommodations are at my discretion and may involve a cumulative open-ended make-up test, re-weighting, and/or may be contingent on performance on other term work and the final exam.

Topics and required readings

Required readings include extensive supplements created specifically for our course, which are marked in boldface below and available on Quercus, and our textbook. Also, the [aid sheets for the entire course](#) are posted on Quercus. Chapter numbers reference our textbook and any exclusions are noted. We finish through Chapter 11 in the Fall term and the rest in the Winter term.

- **“Quiz and Prerequisite Review for ECO220Y1, 2019/20”** pages 1–32
- **“The DACM Handbook for ECO220Y1Y, 2019/20”** pages 1–178: see [DACM Quercus site](#)
- Chapter 1: “An Introduction to Statistics”
- Chapter 2: “Data”
- Chapter 3: “Surveys and Sampling”
- Chapter 4: “Displaying and Describing Categorical Data”
- Chapter 5: “Displaying and Describing Quantitative Data”
- Chapter 6: “Scatterplots, Association, and Correlation”
- SW11: Chapter 1, “Economic Questions and Data” pp. 1–13 from *Introduction to Econometrics*, Third Ed., 2011, by James H. Stock and Mark W. Watson
- Chapter 7: “Introduction to Linear Regression”
- **Logarithms in Regression Analysis with Asiaphoria for ECO220Y1, 2019/20** pages 1-28
- Chapter 8: “Randomness and Probability”
- Chapter 9: “Random Variables and Probability Distributions” (Excluding Sections 9.7 “The Poisson Distribution” and 9.12 “The Exponential Distribution”)
- **“Normal Table: Read it, Use it for ECO220Y1, 2019/20”** pages 1–7
- Chapter 10: “Sampling Distributions”
- Chapter 11: “Confidence Intervals for Proportions”
- Chapter 12: “Testing Hypotheses About Proportions”
- Chapter 13: “Confidence Intervals and Hypothesis Tests for Means”
- Chapter 14: “Comparing Two Means”
- Chapter 18: “Inference for Regression”
- Chapter 19: “Understanding Regression Residuals”
- Chapter 20: “Multiple Regression”
- Chapter 21: “Building Multiple Regression Models” emphasizing Sections 21.1 “Indicator (or Dummy) Variables,” 21.2 “Adjusting for Different Slopes — Interaction Terms,” and “Quadratics” (online)

Communication

Quercus messaging

Please do *not* contact me via Quercus messaging system; use either Piazza or email (see [Email policy](#) before you do).

Piazza

We use Piazza (<https://piazza.com/utoronto.ca/fall2019/eco220yblanchenay/home>) to facilitate communication. To register, go to <https://piazza.com/utoronto.ca/fall2019/eco220yblanchenay>.

Piazza is a complement to face-to-face interactions in office hours, class, tutorials / aid centres, and study groups. Piazza has several advantages over email; first, it promotes your own involvement in the course by encouraging you to answer other students' questions, an excellent way of testing your understanding of the material; second, it allows questions/answers to be shared to all students, who can benefit from this positive externality.

The TAs and I periodically check Piazza to ensure proper usage, flag some postings, and possibly answer some questions. However, Piazza's emphasis is on student-to-student Q&A. Questions can be made anonymous to other students (but they cannot be made anonymous to myself or the TAs).

Email policy

Email is not an appropriate forum for discussing course material details, which are better addressed on Piazza or through office hours. That said, email can be helpful on occasion, and within limits and I will try to reply to email within 24 hours (except weekends) provided your question(s) can be answered with a one or two sentence answer.

Answering email takes up valuable time that could be used more productively on improving the course. To limit this negative externality, I will not repeat information that can be found on the syllabus or on the course Quercus (for example: test dates), nor questions about the course material (which should be posted on Piazza). Please do not send attachments unless I have explicitly asked for it. **Always include [ECO220 L0101] or [ECO220 L0501] in the title of any email, regardless of the topic. Emails that do not include this will be ignored.**

My email address is: patrick.blanchenay@utoronto.ca

Email checklist:

- Your email is sent from your University address.
- Email title begins with [ECO220 L0101] or [ECO220 L0501] followed by the subject of the email.
- The message is straight to the point and no-longer than 10 sentences.
- Your email does not contain attachment, unless I had specifically asked you to send something.
- Your signature includes your Student number, and both the name you are usually addressed by, and your ACORN name if it differs from the name you go by.

Student Well-Being and Academic Accommodations

Well-Being

University of Toronto aims at giving you an enriching learning experience, and has a number of resources to help you stay healthy and be well: <http://studentlife.utoronto.ca/bewell>

However, sometimes things do not go as planned. **In case of emergency, call 911.** For ongoing injury, illness, or personal/family problems, or if you feel you are falling behind in your courses, you must contact your [College Registrar](#) immediately. The earlier you do, the easier it is to find solutions.

There are also a number of resources in case you are feeling distressed: <http://studentlife.utoronto.ca/feeling-distressed> Once again, the earlier you reach out, the easier it is to remedy the situation and find solutions. Do not wait until the end of the academic year.

Ongoing Learning Disability or Accommodation Requirement

Students with diverse learning styles and needs are welcome in this course. If you have an ongoing disability issue or accommodation need, you should register with Accessibility Services (AS) (<http://accessibility.utoronto.ca>) **at the beginning of the academic year.** (Without registration, you will not be able to verify your situation with your instructors, and instructors will not be advised about your accommodation needs.) AS will then assess your medical situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. Remember that the process of accommodation is private: AS will not share details of your condition with any instructor, and your instructors will not reveal that you are registered with AS.

For more information on services and resources available to instructors and students, please contact Tanya Lewis, Director, Director of Academic Success and Accessibility Services, at (416) 978-6268; tanya.lewis@utoronto.ca. Accessibility services: <http://studentlife.utoronto.ca/as/>

Accommodations for Religious Observances

As a student at the University of Toronto, you are part of a diverse community that welcomes and includes students and faculty from a wide range of backgrounds, cultural traditions, and spiritual beliefs. For my part, I will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. Further to University Policy, if you anticipate being absent from class or missing a major course activity (like a test) due to a religious observance, please let me know as early in the course as possible, and with sufficient notice (at least two to three weeks), so that we can work together in case we need to make alternate arrangements (see also [Missed Term Work](#)).

Academic Integrity and Plagiarism

All students, faculty and staff are expected to follow the University's guidelines and policies on academic integrity. For students, this means following the standards of academic honesty when writing assignments, citing and using source material appropriately, collaborating with fellow students, and writing tests and exams. Ensure that the work you submit for grading represents your own honest efforts. Plagiarism, representing someone else's words as your own or submitting work that you have previously submitted for marks in another class or program, is a serious offence that can result in sanctions. Speak to me or your TA for advice on anything that you find unclear. Also, see the U of T writing support website at <http://www.utoronto.ca/writing>. Consult the Code of Behaviour on Academic Matters (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) for a complete outline of the University's policy and expectations

Potential offences include, but are not limited to:

- In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement. This includes verbatim copying of any lecture notes distributed by the instructor.
- Submitting your own work in more than one course without the permission of the instructor.
- Making up sources or facts.
- Obtaining or providing unauthorized assistance on any assignment, including from paid or non-paid tutors.
- On tests and exams:
 - Using or possessing unauthorized aids, including smartphones.
 - Looking at someone else's answers during an exam or test.
 - Misrepresenting your identity.
- In academic work:
 - Falsifying institutional documents or grades.
 - Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes

I encourage you to pay close attention to these sections on Perils and Pitfalls

<http://academicintegrity.utoronto.ca/perils-and-pitfalls> and Smart Strategies

<http://academicintegrity.utoronto.ca/smart-strategies>

Frequently Asked Questions (FAQ)

Is there a lot to memorize?

The course will expose you to new concepts and methods; the analysis of data comes with its own vocabulary that differs from common English. It is important that you know precisely what is meant by “standard deviation”, “binomial”, “probability distribution”, and so on. In addition, the course makes use of many mathematical formulas; while an aid-sheet is provided with each in-class test, it can save time not to have to rely on that.

Ultimately, I test your understanding and mastery by asking questions that might be variations of examples seen in class. Memorization is not sufficient.

How do I do well on this course?

Work regularly and practice as much as you can. This course is not easy. It makes heavy use of abstract thinking using mathematical notation, and logical reasoning; and new material arrives fast. To do well, you need to make sure you understand the material well; the only way to test whether you really understand some concepts is to practice: exercises, problem sets, textbook questions. The more you do the better. Make sure to write full answers to all questions, and problem sets you can set your hands on.

Make sure to use all the help you can: attend all lectures/tutorials, ask questions during office hours or on Piazza, check the textbook, other textbooks if needed, etc. I will not be holding your hand; take ownership of your own learning.

Is the final exam cumulative? Is it different from other instructor's?

Yes, the final exam is cumulative. The final exam is common to all sections of ECO220, including those taught by a different instructor.

Is there extra work I can do to improve my grade? / I really need to maintain my GPA. / I need good grades to apply to XYZ.

No, as this would be unfair to other students. The marking scheme provides ample opportunities to make-up for marks in case you underperformed on one of the graded work.

I have another test/assignment due the same week as our midterm, can I skip?

See the policy about [Missed term work](#).