

ECO220Y: Quantitative Methods in Economics, 2013/14

Prof. Murdock, Economics Department, University of Toronto

Sections: meeting times, rooms (you may attend any of these three sections)

L0101: T 12:10 - 2:00, SS 2135; F 9:10 - 11:00 (F 10:10 - 11:00, SS 2135)

L0301: W 10:10 - 12:00, SS 2118; F 9:10 - 11:00 (F 9:10 - 10:00, SS 2118)

L0401: W 2:10 - 4:00, SS 2102; F 9:10 - 11:00 (F 10:10 - 11:00, SS 2102/SS 2118)

Office hours: T 2:30 - 4:30 (Fall Term); T 2:45 - 4:45 (Winter Term); GE 312

Telephone, e-mail: 416-946-0656, see Section 5

Course site: chass.utoronto.ca/~murdockj/eco220/ & portal

Piazza: <https://piazza.com/utoronto.ca/fall2013/eco220y1murdock/home>, see Section 5

TAs (profiles on portal): Justin, Amy, Ricky, Guenther, Chenyang, Juan, Zach, Kevin

Economics Study Centre: MTWR 11:00 - 5:00, main floor Economics Department, 150 St George St. (GE 110); has a copy of our textbook; opens Sept 30th

1 Academic Integrity, Accessibility & Help

You are expected to uphold your academic integrity. To check what this means see http://www.utoronto.ca/academicintegrity/Academic_integrity.pdf. For accessibility concerns visit <http://www.accessibility.utoronto.ca/>. If you are having trouble seek help right away from us and/or the Academic Success Centre <http://asc.utoronto.ca>. For issues that extend beyond our course contact your College Registrar as soon as possible.

2 Prerequisites

An administrator will remove you for missing prerequisites: ECO100Y1(67%)/ ECO105Y1(80%); MAT133Y1/(MAT123H1, MAT124H1)/(MAT135H1, MAT136H1)/MAT137Y1/ MAT157Y11. See: <http://www.economics.utoronto.ca/index.php/index/undergraduate/load/prerequisites>.

3 Required Textbook & iClicker

The required textbook is a NEW custom book *Business Statistics, Third Custom Canadian Edition for ECO220Y, Published 2013* by Sharpe, De Veaux, Velleman, and Wright (ISBN 9781269514163). (It is a proper subset of ISBN 9780321781833.) The U of T Bookstore and Discount Textbooks have copies. Because the book is new, there are no used copies. The course reserves at Robarts Library and the Economics Study Centre have the required text. Using an older edition is not recommended: it will not contain all of the assigned topics, exercises and solutions. **Consider our textbook authors as co-instructors.** To register for MyStatLab (useful but not required) go to www.mystatlab.com and use course ID instructo98625. **Using an iClicker remote is required:** new and used ones

are available (e.g. U of T Bookstore, amazon.ca). You may borrow an iClicker from a friend/relative or share an iClicker with another student that is *not* currently taking ECO220Y with Prof. Murdock. You must use an iClicker *remote*: iClicker GO is not permitted. If you are unable to obtain an iClicker remote you may register for a short-term loan service.¹

4 Learning Objectives

- (1) Translate between plain English and statistical terms and concepts: identify key information regardless of wording or presentation, discriminate among statements that sound superficially similar but are fundamentally different, and distinguish incorrect statements from correct ones
- (2) Select a suitable quantitative approach to a “new” situation and apply it
- (3) Proficiently read output from various statistical software packages including STATA
- (4) Use Excel to conduct statistical analyses
- (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) Critically evaluate analyses without being dazzled by numbers, data and 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 clear, concise and convincing written arguments

4.1 “What do I have to know for the tests?” “How to prepare?”

The learning objectives tell what you need to do to show that you understand the material at the required depth. Memorization yields only superficial understanding that falls far short of expectations. Instead, practice your skills by reworking examples from class and by constructing full replies for homework and old tests *without* using the solutions as a crutch.

If a concept, skill, or topic is addressed in lectures, required readings OR homework then it is testable. Major concepts will appear multiple times but not necessarily in every venue. Tests questions are inspired by our current course materials (homeworks, lectures, textbook, handouts, etc.). You may hone your test-taking skills and assess the required depth of understanding by working with old tests.

¹This is a short-term loan service: you must return the remote after each class. Visit the Economics Department Reception Desk (150 St George St) weekdays between 9:00 and 4:00 for more information.

5 Communication

I maintain a course site at chass.utoronto.ca/~murdockj/eco220/ and use the portal. The TAs and I make announcements in lectures/tutorials, on the course sites, and/or via e-mail.

We use Piazza (<https://piazza.com/utoronto.ca/fall2013/eco220y1murdock/home>) for communication amongst all class members. Each week I set aside one hour total on Wednesdays (typically shortly after classes) to address postings. TAs will work on Piazza during any down-time in their office hours. We ensure proper usage, flag some postings, and, if time permits, possibly answer some questions. The emphasis is on student-to-student Q & A related to course concepts, homework, old test questions, etc.

For private matters or simply to notify me of problem affecting our course (e.g. broken link, typo, TA issues), my e-mail is jennifer.murdock@utoronto.ca. ***For e-mails asking for a reply, if I can answer briefly and it does not require explaining course content, restating the syllabus or revealing something of general interest, then I will reply within two business days.*** If you receive no reply, check announcements, review the syllabus, post on Piazza, see me in office hours/class, and/or see a TA.

6 Weekly Lectures and TA Tutorials

Tuesday and Wednesday meetings use PowerPoint and require your participation (iClicker). You may visit the course site, print out the lecture slides (black and white is fine), and bring them to class. ***Take your own notes: lecture slides are not lecture notes.*** You can attend section L0101, L0301 or L0401 regardless of your ROSI registration.

Fridays are reserved for tests, make-up classes (as necessary)², and optional TA Tutorials. Tutorials encourage student questions. They focus on homework from the *previous week* so you have time to complete it before the tutorial. Watch for TA announcements on the portal and/or Piazza. Because tests fall on Fridays, some tutorials will be on Mondays: Nov. 4, Nov. 25, Jan. 27, Feb. 24, and Mar. 31. Details posted on the course site.

7 Required Readings & Homework

Readings and homework are on the course site. ***Complete required readings before class. Pay particular attention to ALL of the boxes (e.g. “Just Checking”).*** The textbook highlights important points with boxes (which are sometimes in the margins): skipping these is a terrible idea. Chapter opening and closing segments such as “What Can Go Wrong?” and “Ethics in Action” are always part of the required reading. Complete homework after the related lecture and before the tutorial the following week.

²There is a make-up lecture on Friday, Nov. 15 because L0101 misses a class during the Fall Break.

8 The Economics Study Centre

The Economics Study Centre supports ECO220Y. Peer mentors are undergraduates who have done very well in their ECO courses. For in-depth questions, use our course TAs.

<http://www.economics.utoronto.ca/index.php/index/undergraduate/load/studyCentre>

9 Excel Course Module

Instructor Chen (christy.chen@utoronto.ca) gives the required Excel Course Module (ECM) that complements our course. The ECM will start in late January; you will sign up for weekly Excel tutorial sessions (50 minutes each) that are held in a computer lab. (These are separate from regular TA tutorials.) While at a computer, you will learn how to do statistical analyses using an augmented version of Excel. These help you prepare for the Excel Test to be scheduled in late March/April that you take in a computer lab. Instructor Chen prepares the Excel Test and supervises the marking of it. The ECM uses the portal.

10 Marking Scheme and Assessments

For tests and the final exam you may bring a non-programmable calculator and you must bring your TCard. I expect that Term Tests #1 and #3 will have multiple-choice questions whereas the other tests will have open-ended questions. The “One Question” tests will require a longer written answer and you may expect some extra reading before each and scrap paper during the test. The final exam is typically a mix of question formats. All tests and the final exam are cumulative. All five sections of ECO220Y1Y write the same final exam, which places more than half the weight on material from the Winter term.

Assessment	% of Grade	Length	Dates, Time
iClicker (1st Half)	5 %	–	Sept. 17 – Nov. 27, in classes
Term Test #1	12 %	90 min.	Fri., Nov. 8, 9:30 - 11 am
“One Question” Test #1	5 %	90 min.	Fri., Nov. 29, 9:20 - 10:50 am
Term Test #2	16 %	110 min.	Fri., Jan. 31, 9:10 - 11 am
iClicker (2nd Half)	5 %	–	Jan. 7 – Apr. 2, in classes
“One Question” Test #2	5 %	90 min.	Fri., Feb. 28, 9:30 - 11 am
Term Test #3	12 %	90 min.	Fri., Apr. 4, 9:30 - 11 am
Excel Test	6 %	50 min.	TBA in late Mar/Apr
Final Exam	34 %	3 hrs.	Apr. 9 - 30, TBA by A&S

Why is there so much term work? Course concepts are extremely cumulative: each new topic requires a deep understanding of previous ones. Statistics is learned by doing it and receiving feedback. As an analogy, to learn *how* to ride a bicycle takes practice, not just watching others or memorizing a how-to guide. Term work asks you to *do* statistics.

10.1 iClicker Class Participation

iClicker questions encourage you to prepare for class, talk about statistics, and identify misunderstandings. Complete required readings before class. Like traditional class participation, quality matters. *iClicker responses earn full marks if you answer correctly and partial marks (usually around half marks) if you tried but are incorrect.* This keeps the focus on course concepts and skills rather than marks. Each unanswered question earns 0 points. Point values can vary by question. ***You may attend L0101, L0301 or L0401: your iClicker will work.***³

To register go to <http://www1.iclicker.com/register-an-iclicker>. ***You MUST use your UTORid – NOT your student # – as your “Student ID.”*** It is your responsibility to: correctly register your iClicker, bring it to class, bring any aids you need (calculator, textbook, statistical tables), arrive on time, and stay for the entire lecture.

You may only enter responses yourself using your own properly registered iClicker. Your iClicker participation is a single assessment worth 10 percent of your course grade. A student suspected of cheating on any question jeopardizes this entire mark and possibly much more. 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 iClicker can expect an equally harsh penalty. Protect your friends: do your own work.

The last lecture each term serves as a make-up iClicker session. It can replace your lowest iClicker score during the term. (If you do worse, it will not count against you.)

A green light illuminates on your iClicker remote when your response has been successfully recorded; a red light or no light indicates a problem. If you forget your iClicker, I usually bring a backup.⁴ Nearly all malfunctions – including a “dead” remote – are easily resolved: call support at 866-209-5698 or visit <http://support.iclicker.com/forums/22114026-FAQs>.

10.2 Grading

Your mark on a piece of term work reflects any adjustments to the raw scores such as adding points to everyone’s score or not counting an unduly difficult/confusing question. Your mark, not your raw score, best reflects the quality of your submitted work.

For partial credit, part of what you wrote must be clearly correct, directly relevant to the question asked, AND not contradicted by other parts of your answer. Requests for remarking must: (1) Be made IN WRITING and given to me along with your entire assessment, (2) Explain, in specific terms, WHY more points are justified for each disputed question, (3) Be submitted within two weeks. The entire assessment will

³If you attend the same lecture more than once, only the first counts towards your mark.

⁴Available first-come, first-serve if you have not made this request before. See me and bring your TCard.

be remarked: your mark can go up, down, or remain unchanged. For open-ended questions handwritten marks include the points you earned and, if applicable, the following symbols.

Symbol	Near the part of your answer that is:
X	Incorrect
?	Logically unclear, confusing or illegible
\oplus	Imprecise, incomplete, insufficiently shows work (Idea: “plus” more)

10.3 Missed Tests

Make-up tests are cumulative and will be scheduled at a time and date chosen by the instructor with as little as one business day’s notice via e-mail. The format is open-ended questions. A make-up test can replace only one missed test: additional missed tests earn a mark of zero. To request the make-up test you must complete *ALL* of these steps.

First Step: Send an e-mail to Prof. Murdock meeting *ALL* of these specifications.

- (1) Your e-mail is sent *BEFORE* the start of the missed test. (Note: Five percentage points will be deducted from your make-up test mark for each hour or part of an hour that your e-mail is late. It is unacceptable to fail to show up for an important engagement without any advance notice.)
- (2) It is sent from your U of T e-mail account (and not gmail, yahoo, etc.).
- (3) The subject line is “missed test.”
- (4) The e-mail is in *PLAIN TEXT FORMAT* and has *NO ATTACHMENTS*.⁵
- (5) It concisely explains why you missed the test.
- (6) It lists all of your current courses and professors.
- (7) It identifies *ALL* of your efforts in other courses for the three days up to and including the missed test in our course (or it explains that you did nothing).
- (8) The last sentence is: “I understand that it is a punishable academic offense to present false or misleading information with my request for a make-up test.”
- (9) The e-mail closes with your name and student number.
- (10) It is less than 250 words. Its tone and content are appropriate for an academic setting. Everything except the last sentence uses your own words.

Second Step: Check your e-mail. Within one business day of the missed test you will receive an e-mail: it will be a simple notification of when and where to take the make-up test. (Note: The e-mail is sent after the missed test and *not* within one day of the receipt of your e-mail.)

Third Step: Complete the make-up test. A missed make-up automatically earns a mark of zero.

⁵The e-mail is the required documentation. I have found documents completed by medical professionals unhelpful: they focus on serving their patients, not defending academic integrity at U of T.

11 Topics and Required Readings

The course covers the following chapters in the required textbook. Within each chapter all sections are required with exceptions noted below. We typically finish the first eleven chapters in the Fall term and the remaining chapters in the Winter term.

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

Chapter 7: Introduction to Linear Regression

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)

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 (Excluding Section 20.7 The Logistic Multiple Regression Model)

Chapter 21: Building Multiple Regression Models

There are some other required readings. One is Chapter 1, “Economic Questions and Data,” from *Introduction to Econometrics, Third Ed.*, 2011, by James H. Stock and Mark W. Watson (SW11) and another is an academic journal article co-authored by a winner of the Nobel prize in economics: “Belief in the Law of Small Numbers” by Amos Tversky and Daniel Kahneman published in 1971 in *Psychological Bulletin* (TK71). Required readings and handouts (beyond the textbook) are provided in either electronic or hardcopy format.