

# ECO220Y: Quantitative Methods in Economics, 2016/17

Prof. Murdock, Economics Department, University of Toronto

**Sections:** days, meeting times, rooms

**L0301:** Wed 10-12, FG 103; Fri 9-11: 10-11, LM 159(Fall)/FG 103(Winter)

**L0401:** Wed 2-4, WB 116(Fall)/FG 103(Winter); Fri 9-11: 9-10, SS 2117

**L0501:** Thur 10-12, KP 108; Fri 9-11: 10-11, SS 2117

**Course site:** <http://homes.chass.utoronto.ca/~murdockj/eco220/> & portal

**Piazza:** <https://piazza.com/utoronto.ca/fall2016/eco220y>, see Section 12

**Office hours (GE 312, 150 St George):** F 1:30 - 3:30 (any rescheduling posted on course site)

**Telephone, e-mail:** 416-946-0656, see Section 12

**TAs:** Mathieu M. (HEAD TA), Thomas, Ruizhi, Jerry, Cara, Mathieu R., Molly, Yangyi, Spencer, Rabiya

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

## 1 Get Enthusiastic about this Exciting Course

To motivate your study in ECO220Y, consider these 2016 conclusions (excerpts) of Professor Richard Thaler, University of Chicago.

There is one central theme of this essay: it is time to fully embrace what I would call *evidence-based economics*. This should not be a hard sell. Economists use the most sophisticated statistical techniques of any social science, have access to increasingly large and rich datasets, and have embraced numerous new methods from experiments (both lab and field) to brain imaging to machine learning. Furthermore, economics has become an increasingly empirical discipline. Hamermesh (2013) finds that the percentage of “theory” papers in top economics journals has fallen from 50.7 percent in 1963 to 19.1 percent in 2011. We are undeniably an empirical discipline—so let’s embrace that.

Viewed in this context, behavioral economics is simply one part of the growing importance of empirical work in economics. There is nothing unique about incorporating psychological factors such as framing, self-control, and fairness into economics analyses. If such factors help us understand the world better and improve predictions about behavior, then why wouldn’t we use them just like we would use any other new source of data such as web searches or genetic markers?

If economics does develop along these lines the term “behavioral economics” will eventually disappear from our lexicon. All economics will be as behavioral as the topic requires, and as a result, we will have an approach to economics that yields a higher  $R^2$ .<sup>a</sup>

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<sup>a</sup>Excerpt, p. 1597: Thaler, Richard H.. 2016. “Behavioral Economics: Past, Present, and Future.” *American Economic Review*, 106(7): 1577-1600. DOI: 10.1257/aer.106.7.1577

## 2 Textbook & iClicker

The textbook is a custom book *Business Statistics, Third Custom Canadian Edition for ECO220Y, Published 2013* by Sharpe, De Veaux, Velleman, and Wright. To register for MyStatLab (not required) go to [www.mystatlab.com](http://www.mystatlab.com) and use course ID instructo63219. The [U of T Bookstore](#) and [Discount Textbooks](#) have copies. Used copies are available: this edition has been the required text since 2013/14. Editions published before 2013 are *not* recommended. Consider our textbook

authors as co-instructors. Using an iClicker remote is required. You may buy a used iClicker, borrow an iClicker or share an iClicker with anyone that is *not* currently taking ECO220 with Prof. Murdock. You must use an iClicker *remote*: iClicker REEF is *not* permitted.

### 3 Prerequisites

ECO100Y1(67%)/ ECO105Y1(80%); MAT133Y1/(MAT135H1,MAT136H1)/MAT137Y1/MAT157Y1. An administrator will remove anyone missing prerequisites. I cannot waive prerequisites: <http://www.economics.utoronto.ca/index.php/index/undergraduate/load/prerequisites>.

### 4 Weekly Lectures, Fridays, our TA Support and our Head TA

Wednesday and Thursday meetings use PowerPoint and require your participation (iClicker). The lecture slides are on our course site before class. You may print the lecture slides (black and white is fine): these include blank space for notes. ***Take notes: slides are not notes. You may attend L0301, L0401 or L0501, provided there is space.*** Fridays are for TA tutorials (50 minutes), tests (110 minutes), and any special classes. I give the TAs weekly lesson plans for TA tutorials. You are free to go to any tutorial section. Because tests fall on Fridays, there will be no regular TA tutorials those weeks. However, there are TA review sessions and TA aid centres before tests/exams: details to be posted on portal announcements. **Our Head TA is Mathieu Marcoux ([mathieu.marcoux@mail.utoronto.ca](mailto:mathieu.marcoux@mail.utoronto.ca)).** He manages our team of TAs, marking, portal announcements, and portal quizzes.

### 5 Required Readings & Homework

The course site gives readings and homework for each class. ***Complete readings before class.*** The textbook highlights important points with boxes (sometimes in the margins). Take seriously the boxes, including “Just Checking.” Chapter openers and closers such as “What Can Go Wrong?” are always part of the required reading. Complete homework soon after each lecture.

### 6 Academic Integrity, Accessibility & Help

You are expected to uphold your academic integrity: see <http://www.artsci.utoronto.ca/osai>. For accessibility concerns visit <http://www.studentlife.utoronto.ca/as>. If you have trouble, seek help right away from us, your College Registrar, and/or the Academic Success Centre <http://www.studentlife.utoronto.ca/asc>. ***For any issues that extend beyond our specific course, contact your College Registrar immediately.***

### 7 Economics Study Centre: Open Daily, 150 St George

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. On the course site I will alert you to specific peer mentors that took ECO220Y with me. <http://www.economics.utoronto.ca/index.php/index/undergraduate/load/studyCentre>.

## 8 Learning Objectives: Expected Depth of Understanding

- (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 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) 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

Construct *full* replies for homework and old tests/exams in test-like conditions. If you cannot solve a question after a sustained effort, turn to your notes, book, and homeworks. Only as a *last resort*, ask a person or look at the solutions. Browsing solutions (or peeking) undermines your study and robs you of practice for a test/exam. Use solutions to *grade* your own answers.

***Topics addressed in lectures, homework, or required readings are testable.*** If a concept appears in multiple venues then that signals high importance. Test questions are inspired by our current course materials (homeworks, lectures, textbook, readings, etc.). You may hone your test-taking skills and assess the required depth of understanding by working with old tests.

## 9 Excel Course Module (ECM)

Instructor Chen ([christy.chen@utoronto.ca](mailto:christy.chen@utoronto.ca)) gives the required Excel Course Module (ECM) that complements our course. All sections of ECO220Y1Y complete the ECM (not just mine). Instructor Chen develops the ECM curriculum and materials, trains a team of TAs, prepares the graded work, and supervises its marking. Look for the ECM site, including the ECM syllabus, on portal.

You will sign up for weekly Excel tutorials held in a computer lab. ECM tutorials start the week of

September 26. (These are separate from regular TA tutorials.) These help you prepare for graded ECM work, which includes an Excel test in a computer lab.

Look for portal announcements and e-mails to sign up for Excel tutorials and tests: a range of times and days will be available, first-come, first-served. Make sure to double-check your schedule before signing up. All ECM inquires should be directed to Instructor Chen ([christy.chen@utoronto.ca](mailto:christy.chen@utoronto.ca)) or the ECM Head TA Thomas Russell ([thomas.russell@mail.utoronto.ca](mailto:thomas.russell@mail.utoronto.ca))

## 10 Marking Scheme

The table below shows how course grades will be calculated. ***For all tests and the exam, bring your TCard, pencils, erasers, and a non-programmable calculator.*** Tests #1, #2, #3, and #4 are planned to be open-ended questions. Your “best 3 of 4 term tests” will be your average mark on the best of 3 of the 4 tests. A mark of zero is recorded for any missed test. See Section 10.2 for details about missed term work. All sections write the same cumulative final exam, which is typically a mix of question formats. For some tests and 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 may have extra background reading and study materials before tests and the exam. You will be given aid sheets: formulas and relevant statistical tables. The aid sheets for the entire course are posted [http://homes.chass.utoronto.ca/~murdockj/eco220/AS220\\_2016\\_17.pdf](http://homes.chass.utoronto.ca/~murdockj/eco220/AS220_2016_17.pdf): bring a copy and a calculator to classes and TA tutorials.

Assessment	Weight	Length	Due Dates
Best 3 of 4 Term Tests	50 %*	–	–
Term Test #1	–	110 min.	Friday, Nov. 4, 9:10 - 11 am
Term Test #2	–	110 min.	Friday, Jan. 13, 9:10 - 11 am
Term Test #3	–	110 min.	Friday, Feb. 10, 9:10 - 11 am
Term Test #4	–	110 min.	Friday, Mar. 31, 9:10 - 11 am
Fall Weekly Participation	7.5 %*	–	Sept. 16 – Dec. 5
Winter Weekly Participation	7.5 %*	–	Jan. 5 – Apr. 3
ECM graded work	10 %	–	Sept. – Mar.
Final Exam	25 %*	3 hrs.	Apr. 10 - 28, <a href="#">TBA by A&amp;S</a>

\*Possible re-weighting: If the simple average of your final exam mark and your *lowest mark* on Term Tests #1, #2, #3, and #4 is higher than your weekly participation mark (either term), then the weight for that weekly participation will move to that simple average. This can apply to one or both terms. See Section 10.1.4 for the rationale.

***Why is there so much term work?*** In ECO220Y each new concept requires a deep understanding of previous ones. Statistics is learned by doing it and seeking feedback. Only a fraction of your efforts can be graded by us: you are expected to grade yourself against posted solutions for regular homework and old tests/exams. Graded assessments ask you to *do* statistics: make sure that your practice time is focused on *doing* rather than passively reviewing and reading.

## 10.1 Weekly Participation

A major goal of weekly participation is to nudge you towards successful study strategies. After each term, I will post your overall weekly participation mark in MyGrades on portal. It is based on a combination of portal quizzes and iClicker class participation. Each is discussed next.

### 10.1.1 iClicker Class Participation: During All Lectures

iClicker questions encourage you to prepare for class, talk about statistics, and identify misunderstandings. Complete readings before class. Like any class participation, quality matters. Correct iClicker responses earn full marks. Incorrect answers earn partial marks. Each unanswered question earns 0. Point values can vary by question. ***You may attend L0301, L0401 or L0501: your iClicker will work.***<sup>1</sup> 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.

Every lecture, except Lecture 1, counts for marks. Lectures 12 and 24 serve as make-ups for each term and replace your lowest iClicker score. (If you do worse, it will not count against you.)

To register (or re-register) go to <https://www1.iclicker.com/register-clicker/>. You MUST use your **UTORid** – NOT your student # – as your “Student ID.” You *must* properly register before the last class (or your iClicker mark will be zero). Your replies *are* recorded even if you are not registered, but registration tells us who gets credit for that work. If you encounter a \$6.99 fee for registering your remote, see me before/after class: bring your iClicker remote and TCard.

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. A red light (or no light) indicates a problem. The *last* answer you press (while voting is still active) is graded. If you forget your iClicker, I usually bring a backup.<sup>2</sup> Nearly all strange remote behavior can be fixed by replacing ALL batteries. For support call 866-209-5698 or visit <http://support.iclicker.com/>.

***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) properly register with your UTORid. Check (1) during class. To check (2), go to <https://www1.iclicker.com/register-your-remote/remote-id-lookup-tool/>, enter your UTORid, and make sure your registration is active.<sup>3</sup>

***You may only enter responses yourself using your own properly registered iClicker.*** Cheating on any question jeopardizes the entire weekly participation mark (15 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.

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<sup>1</sup>If you attend the same lecture more than once, only the first counts. Friday TA tutorials do not involve iClickers.

<sup>2</sup>Available first-come, first-serve if you have not made this request before. See me and bring your TCard.

<sup>3</sup>If you can only find your registration with your student number then you are NOT registered properly. Once you re-register correctly, you will get credit for *all* earlier participation.

### 10.1.2 Portal Quizzes: Due Online Every Monday at 6:00pm

Portal quizzes help you keep up with our course *every week*. Questions are planned to be short-answer. A common question format requires you to type an exact numeric answer. Portal quiz questions may require more calculations than the iClicker questions in class. Like the iClicker, reasonable collaboration is allowed. However, your questions may vary from others so only real collaboration (not simply copying) is helpful. Also, like the iClicker, some partial marks are awarded for attempting questions even if your answer is wrong. Prior to starting each quiz, make sure you have completed the assigned readings and homework for the most recent (and earlier) lectures. Also, spend about 10 minutes editing the notes you took in class that week. Make sure your calculator, aid sheets, notes, textbook, and homeworks are handy before starting. If you are well-prepared, a typical portal quiz should take 45 minutes or less to complete.

Portal quizzes become active each Friday at noon. You have until 6:00pm on Monday, which is 3.25 calendar days, to complete it. This *includes* the Mondays of Thanksgiving, Fall Break and Reading Week. ***Once you begin, you typically have a maximum of 60 minutes to finish.*** There will be one make-up portal quiz that opens Friday, Dec. 2 at noon and is due at 6:00pm on Monday, Dec. 5 and one make-up portal quiz that opens on Friday, Mar. 31 at noon and is due at 6:00pm on Monday, Apr. 3. Each make-up, which may be longer than a usual quiz, may replace up to two of your lowest portal quiz marks (including 0's) for the corresponding term. ***However, beyond the make-up quizzes (and the possible re-weighting (\*) in the marking scheme), there are no further accommodations for reasons such as technical difficulties (browser problem, power outage, laptop malfunction, software issue, etc.), lateness, forgetting about it, typing errors, improper rounding, failing to type your answer in the requested format, or unexpected interruptions after starting the quiz.*** Start each portal quiz well before the deadline and when you have the uninterrupted time needed to finish it.

***How can I see my results for each portal quiz?*** After the due date, you can see the questions and your answers by going to MyGrades, clicking on the title of the quiz (which will open the assessment details in a new window), and then clicking on your grade (under Calculated Grade). MyGrades will show only your *raw score* on the quiz (portal does not allow partial credit for wrong attempts, but I do). Your overall weekly participation mark (that I calculate using portal quiz marks and iClicker marks) will be posted on MyGrades after each term is complete.

### 10.1.3 Weekly Participation: Only a Fraction of Your Weekly Work

You should average at least 8 hours per week on our course.<sup>4</sup> Spending 110 minutes participating in lecture, 50 minutes participating in TA tutorials, and about 60 minutes completing portal quizzes gets you less than halfway there. The remaining time should be spent primarily on actively solving problems (regular homework and old test/exam questions when reviewing) and working with the readings. Most of your preparatory work will be graded only indirectly (in other words, in tests and exams).

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<sup>4</sup>During the regular academic year a full-time student takes 5 courses per term. Presuming full-time means at least 40 hours per week, that is 8 hours per course per week.

### 10.1.4 Possible Re-Weighting of Weekly Participation

Everyone is *strongly* encouraged to do their best work each week on the portal quizzes and iClicker questions and to take advantage of the make-up opportunities automatically granted to everyone.

The possible re-weighting in the marking scheme (Section 10) accommodates people who, for whatever reason, *consistently* do better on tests and exams than weekly participation. In that circumstance, and if it would improve a person's course grade, I will move the weight for weekly participation to the simple average of (1) the *lowest mark* of the four term tests and (2) the final exam mark, which again highlights the need for consistency. For example, if someone earns: 65% on Test #1; 75% on Test #2; 70% on Test #3; 80% on Test #4; 58% on Fall Weekly Participation; 44% on Winter Weekly Participation; 76% on the ECM; and 77% on the Final Exam, the overall course grade is 75 (with re-weighting), not 72 (no re-weighting). I expect this possible re-weighting would apply to a fraction of students and that many people who regularly make a strong effort on weekly participation will find that it *directly* helps (not hurts) their course grade. For example, if someone earns the same test and exam marks as above but 86% on Fall Weekly Participation and 83% on Winter Weekly Participation, the overall course grade is 77 (no re-weighting).

The weekly participation is meant to be a learning experience that helps you identify tricky areas needing more study. Hence, rather than feel discouraged about getting portal quiz or iClicker questions incorrect, use this feedback to address weaknesses before the tests and exam. Even if weekly participation does not directly help your grade, it should *indirectly* help by causing higher test and exam marks.

## 10.2 Missed Term Work

You are expected to complete all required work as scheduled in Section 10. The marking scheme already includes multiple accommodations for missed term work.<sup>5</sup> The “best 3 of 4” policy accommodates students that cannot write one 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 marking scheme also includes accommodations for missed portal quizzes or iClicker participation: there are make-ups for each. The “best 3 of 4,” iClicker, and portal quiz accommodations are automatically applied to everyone: you do NOT need request these. Also, there is a make-up for the Excel test (with details in the ECM syllabus).

Accommodations beyond those in the previous paragraph are nearly always *not* possible. Potential exceptions are *extremely specific*: **(1)** I am asked to consider extraordinary accommodations by a student's College Registrar who has been contacted *at the earliest possible date* after the *start* of any *ongoing and substantial* injury, illness, or personal/family problems seriously affecting the student's ability to complete term work across all courses or **(2)** I am contacted by the student *very far in advance* about multiple conflicts *not* related to injury, illness or personal/family problems (e.g. an athlete who notifies me in September of international competitions on Nov. 4 and Feb. 10).

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<sup>5</sup>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](http://www.artsandscience.utoronto.ca/ofr/calendar/Rules_&_Regulations.html).

For ongoing injury, illness, or personal/family problems you must contact your College Registrar immediately. For any extraordinary circumstances, I will consider whether accommodations can still meet all course requirements or whether the student must be advised to drop the course and consider retaking it when able to complete required work. Any extraordinary accommodations are at the sole discretion of the instructor and may involve a cumulative open-ended make-up test and/or may be contingent on performance on other term work and the final exam.

### 10.3 Grading

Your percentage mark on a test, exam or other 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.

Symbol	Near the part of your answer that is:
X	Incorrect
?	Logically unclear, confusing or illegible
⊕	Does not address all parts of the question and/or insufficiently shows work (Idea: "plus" more)

For open-ended questions, TAs write the points earned and, if applicable, the symbols above. For some questions TAs may also write comments. For questions with full solutions you are expected to *critically evaluate* your answer compared to posted solutions. ***For partial credit, part of your answer must be clearly correct, directly relevant to the question asked, AND not contradicted by other parts of your answer.***

#### 10.3.1 Remark Requests

Remark requests must: (1) Be made in an E-MAIL to our Head TA ([mathieu.marcoux@mail.utoronto.ca](mailto:mathieu.marcoux@mail.utoronto.ca)), subject "remark request," that includes the *link* to your paper in Crowdmark (*no* attachments), (2) Explain WHY more points are justified for each disputed question, (3) Be sent within TWO WEEKS of the work's return to the class. The entire submission may be remarked: your mark can go up, down, or remain unchanged. Any remark requests are batch-processed sometime *after* the two-week deadline, not immediately.

## 11 Messages to you from recent ECO220Y survivors

"If you could post the Mid-Course Review responses at the beginning of the course, it would really help students figure out how to efficiently study much earlier on" (anonymous, U of T evaluations, March/April 2016). Some quotes from the January 2016, ECO220Y, Mid-Course Review:

- *Practice, practice, practice. Swimming in the ocean of problems really helps.*
- *Do the readings/homework/portal quizzes on time no matter how busy you are.*
- *Print out lecture slides in advance and make notes on these rather than writing everything by hand.*
- *Do more practice problems and look over the solutions only AFTER you try to do the problem.*
- *Focus more on the writing side of things (how to explain answers, analysis, etc.), mostly through dedicating more time to practice.*



- Focus on doing the textbook chapter questions rather than taking study notes of each chapter.
- Do ALL of the homework questions rather than just a selected few, before the weekly quizzes.
- Before each term test, review all the portal quiz questions you did wrong.

Some quotes from the March/April 2016, ECO220Y, U of T evaluations:

- *Missing a lecture is not a good idea in this course!*
- *The tutorials actually helped refine difficult concepts and they walked us through worthwhile examples.*
- *The weekly homework and portal quizzes were vital to obtaining a good mark.*
- *iClicker questions engaged the class, encouraged participation/attendance, and allowed the students to determine whether or not they understood the given material.*
- *The required readings helped me prepare. In terms of the lectures, I had already gained some background knowledge to prevent me from being lost during the lecture. The readings were also a great reference after lectures if I had forgotten an important concept.*
- *Be prepared to work hard. It does require a lot of time to study, breaking it up into chunks during the week helps. Do the chapter questions that are specific to each section (20.1, 20.2, 20.3 etc) as you read each section. This will help you test your knowledge as you read to make sure you have understood that section. Do the required questions!*
- *The homework and quizzes were challenging, but it kept me up to date with the material and helped me do well on the tests.*
- *ECO study centre is really helpful.*
- *Having the answer key to all the textbook questions is very useful.*
- *Tutorials were great. Piazza was a fast option as well. The additional office hours and review session before tests provided excellent support to help solidify concepts!*
- *I spent around 8 hours per week on this course.*
- *The quizzes and iclicker helped a lot even if they were not always easy. I'd say the course content is pretty tough and requires a lot of work, but it was definitely worth it.*

## 12 Communication

Our main course site is <http://homes.chass.utoronto.ca/~murdockj/eco220/> and we use the portal. We use Piazza (<https://piazza.com/utoronto.ca/fall2016/eco220y/home>) to facilitate communication. 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.*** Piazza is a complement to face-to-face interactions in office hours, class, TA tutorials/review sessions/aid centres, and study groups. ***Piazza is a substitute for e-mail.***

For private matters or to notify me of a general problem/issue affecting our course, my e-mail is [jennifer.murdock@utoronto.ca](mailto:jennifer.murdock@utoronto.ca). For e-mails asking for a reply, if I can answer briefly *without* explaining course content or revealing something of general interest, then I will reply within three business days. ***For any question that would interest other people (e.g. a question about an upcoming test, a tricky course concept, etc.), you must post on Piazza if you are hoping for an electronic reply.***

## 13 Topics and Required Readings

The regular required readings, for all sections of ECO220Y1Y, include selections from our textbook and separate supplements. Also, the aid sheets for the entire course are posted: [http://homes.chass.utoronto.ca/~murdockj/eco220/AS220\\_2016\\_17.pdf](http://homes.chass.utoronto.ca/~murdockj/eco220/AS220_2016_17.pdf). Except where otherwise noted, items below refer to chapters from our textbook. Within each reading, all sections are required, with any exceptions noted below. By the end of the Fall term we are typically into Chapter 12 and we cover the remaining topics in the Winter term.

- “Math Review with a Diagnostic Quiz” [http://homes.chass.utoronto.ca/~murdockj/eco220/MATH\\_REV\\_ECO220.pdf](http://homes.chass.utoronto.ca/~murdockj/eco220/MATH_REV_ECO220.pdf)
- 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,” 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” [http://homes.chass.utoronto.ca/~murdockj/eco220/logarithms\\_in\\_regression\\_analysis\\_with\\_Asiaphoria.pdf](http://homes.chass.utoronto.ca/~murdockj/eco220/logarithms_in_regression_analysis_with_Asiaphoria.pdf)
- 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”)
- “The Normal Table: Read it, Use it” [http://homes.chass.utoronto.ca/~murdockj/eco220/normal\\_table\\_read\\_it\\_use\\_it.pdf](http://homes.chass.utoronto.ca/~murdockj/eco220/normal_table_read_it_use_it.pdf)
- 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” with *emphasis* on Sections 21.1 “Indicator (or Dummy) Variables”, 21.2 “Adjusting for Different Slopes – Interaction Terms,” and 21.6 “Quadratics”

***Make sure to visit the Readings folder in portal.*** Optional (and recommended) reading, sometimes referenced in lectures, is “Belief in the Law of Small Numbers” by Amos Tversky and Daniel Kahneman published in 1971 in *Psychological Bulletin* (TK71).<sup>6</sup>

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<sup>6</sup>This is an academic journal article co-authored by a winner of the Nobel prize in economics.