ECO220Y Quantitative Methods in Economics 2011/12
Prof. Murdock, Economics Department, University of Toronto

Sections: meeting times, rooms

    L0101: W 2:10-4:00 & F 11:10-12:00, AH100 (Fall), EM001 (Winter)

    L0401: R 10:10-12:00 & F 10:10-11:00, SS2118 (both Fall & Winter)

    L0201: R 2:10-4:00 & F 11:10-12:00, MP103 (Fall), SS2118 (Winter)

Drop by "lounge hours": Wednesdays 4:20 - 5:30, EM 302

Drop by "coffee hours": Thursdays 12:50 - 1:50, SS main floor lounge, by Second Cup

Telephone & e-mail: 416-946-0656; See Section 5

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

Head TAs: Jung Baek, Ashique Habib, and Adrienne Wang

1 Academic Integrity, Civility, Accessibility & Help

You are expected to consistently uphold your academic integrity. To check what this means see http://www.utoronto.ca/academicintegrity/Academic_integrity.pdf. Make sure your style of expression when speaking, writing, or acting is appropriate for an academic environment and shows respect for your classmates and instruction team. For any accessibility concerns, please visit http://www.accessibility.utoronto.ca/. If issues arise please seek help right away by contacting us and/or using U of T's academic support services listed at http://life.utoronto.ca/get-smarter/academic-support.htm. For issues that extend beyond our course please seek the help of your College Registrar.

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 custom book that is a proper subset of the First Canadian Edition of *Business Statistics* by Sharpe, De Veaux, Velleman, and Wright. Consider our textbook authors as co-instructors. A package, complete with a full solutions manual and access to MyStatLab, is available at the U of T Bookstore. When registering for MyStatLab at www.pearsoned.ca/mystatlab please use course ID **instructo48723**. Other books are not substitutable. Some used copies may be available from Summer 2011. An iClicker is also required: new and used ones are widely available (e.g. U of T Bookstore, amazon.ca).

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) Craft clear, concise and convincing written arguments

(11) Verbally explain statistical concepts to others and support your conclusions

(12) Explain and apply concepts in an academic journal article by a Nobel laureate

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, tutorials, *or* homework then it is testable. Major concepts will appear multiple times but not necessarily in every format and venue. Tests questions are inspired by our current course materials (homeworks, lectures, textbook, tutorials, handouts, etc.). You should work with these sources extensively. You may also hone your test-taking skills, identify some concepts that are giving you trouble, and assess the general expectations regarding your depth of understanding by working with old tests.

5   Communication and Course Websites

Prof. Murdock maintains the course website at chass.utoronto.ca/~murdockj/eco220/ whereas our TAs use the portal (which links to the course website). The TA's and I make important announcements in lectures/tutorials, on the websites, and/or via e-mail to the class. We obtain your U of T e-mail address from the portal. You should not expect a personal reply if you e-mail me with a request. *If you have a private concern or if you*

would like a personal reply then please speak to me in person during my posted "hours" given at the top of this syllabus. In contrast, if there is a course issue that you think I should know about (e.g. error in posted solutions, broken link on the course website, etc.), please feel free to notify me via e-mail. In other words, you can use e-mail with me the same way I do with you: to let the other know about something but not as part of a back-and-forth discussion. For the latter, we need to talk.

6 Weekly Lectures and TA Tutorials

Lectures are most often PowerPoint presentations with participation opportunities (i.e. using an iClicker). You may visit the course website, print out the lecture slides, and bring them to class. Black and white or gray scale print-outs are fine. You need to **take your own notes**: lecture slides are not lecture notes.

TA Tutorials – an important course component – are held in the Friday time slot. These will be highly interactive: come ready to work. Tutorials may include quizzes, simulations, team assignments, and group presentations. In general you should bring your textbook, notes, handouts, a calculator, a pencil, eraser, and some note-taking paper. (Tutorials will not use iClickers.) Watch for TA announcements and/or e-mails through the portal about what you need to do to prepare for each tutorial.

7 Required Readings and Homework

Readings and homework are posted on the course website each week. You are expected to complete the readings before class. As you read, complete the "just checking" segments. Also, the chapter closing segments such as "what can go wrong" and "ethics in action" are part of the required reading.[1] The assigned exercises and problems are best completed after the related lecture. When tempted to peek at homework solutions remember that tests and exams do not have any hints.

8 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 January; you will have a chance to sign up for training held in a computer lab. (These are separate from regular TA tutorials.) While seated 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 March that you take in a computer lab. The ECM has a portal course site.

---

[1]These are always part of the required reading just like the introduction but will not be separately listed with the specific reading assignments.

9 Marking Scheme and Assessments

Assessment	% of Grade	Length	Dates & Time
iClicker (Fall)	5 %*	–	Practice: first lecture
			Graded: Sept. 21 - Dec. 1
Term Test #1	15 %	90 min.	Friday, Nov. 11, 9:30 - 11:00am
			EX 100 (A - K); EX 200 (L - Z)
iClicker (Winter)	5 %*	–	Graded: Jan. 11 - Apr. 5
Midterm Test	20 %	110 min.	Monday, Jan. 16, 4:10 - 6:00 pm
			EX 100 (A - K); EX 200 (L - Z)
Term Test #3	15 %	90 min.	Friday, Mar. 23, 9:30 - 11:00 am
			EX 100 (A - K); EX 200 (L - Z)
Excel Test	6 %	TBA	TBA Prof. Chen in March
Final Exam	34 %	3 hrs.	Apr. 11 - 30, TBA by A&S

* If you have written Test #1, the Midterm, & Test #3, your academic integrity is beyond question, and it would improve your grade then the weights marked with a * will each be lowered by 2 % and your Test #1 weight will be raised to 16 %, your Midterm weight raised to 21 %, and your Test #3 weight raised to 17 %.

For term tests you may not arrive late (without penalty) and you must stay for a minimum of 60 minutes. You may bring your own non-programmable calculator and you must bring your University of Toronto TCard. Multiple choice and other formats are used. All tests and exams are cumulative.

9.1 Academic Conflicts

If you notify us enough in advance we can accommodate documented direct academic conflicts by having you start a test a bit earlier or later. A direct conflict is **overlapping** times for required course work. This does **not** include multiple term tests on the same day at different times. If you have a conflict, complete these steps:

First Step: Print a **hardcopy** of your ROSI personal timetable. On it please note the piece of term work with a conflict (e.g. Term Test #1), describe the work in the other course that conflicts (e.g. regular lecture, test), and write your student number. On the timetable circle the other course with the conflict and write in your other instructor's name.

Second Step: Give this hardcopy of your timetable to either Prof. Murdock or a Head TA in person **at least two weeks before** the date of the conflict.

Third Step: Find out when and where you are supposed to write our test.

9.2   iClicker Lecture Participation

Lectures include iClicker questions. These encourage you to prepare for class, to talk (about statistics) with your classmates, and to identify misunderstandings. Just like more traditional class participation marks, quality matters. It is not enough to simply be physically present and pressing buttons. Hence, your iClicker responses will earn some points if your answer is incorrect but more points if correct. Each unanswered question earns 0 points. Point values can vary across questions.

To register go to http://www.iclicker.com/support/registeryourclicker/; type your name, **UTORid**, and iClicker remote 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. If the green vote status light illuminates when you submit a response then it has been successfully recorded; a red light indicates a problem. If you forget your iClicker, I usually bring two loaners.[2] You may attend L0101, L0201, or L0401.[3]

*Y*ou may only enter responses yourself using your own properly registered remote. 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.

9.3   Grading

A machine marks multiple choice questions. Your mark and machine-read responses will be posted on the course website as soon as possible. For long answer 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)

To earn partial credit requires that part of your answer is 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 which questions were improperly marked, (3) Be submitted within one month. The entire assessment will be remarked: your mark can go up, down, or remain

---

[2]These are available first-come, first-serve to students who never requested one before. See me (when it would not interrupt the lecture) to give a deposit and to do the temporary registration.

[3]If you attend more than one, only the first one will count towards your mark.

unchanged. These conditions do not apply to clerical errors such as adding up your score wrong. If a clerical error occurs, please let me know as soon as possible.

9.3.1 Marks versus raw scores

Your mark on a piece of term work reflects any class-wide adjustments in the raw percentage scores. Some examples: adding three points to everyone's score or not counting an unduly difficult/confusing question. Any adjustments will be explained to the class. Your mark, not your raw score, best reflects the quality of your submitted work.

9.4 Missed Term Work

Term work is a crucial component of our course. If you cannot complete the term work as scheduled, consider re-taking this course when you are able. The weight for missed term work will **not** be reallocated to other work or the final examination. You must write a make-up test. A make-up test can accommodate only one missed test: additional missed tests earn a mark of zero. If you miss term work and wish to request an opportunity to write the make-up test then you are responsible for accurately completing **all** of these steps.

First Step: Write a letter to Prof. Murdock meeting **all** of the following specifications.[4]

(1) It identifies what term work you missed. What was the work, the date, and **the topics covered**?

(2) It describes what efforts *you* have made to compensate for the missed work and topics so that you remain up-to-date with the course.

(3) It explains why you missed the term work.

(4) It lists the other courses are you taking and the names of your other professors. It identifies any term work you submitted in other courses on the same day or two days before or after the missed term work in our course.

(5) The last sentence in the body of your letter is: "I understand that it is a punishable academic offense to present false information in support of my request for accommodation for missed term work."

(6) It is word-processed and comfortably fits on one side of a standard 8.5 by 11 inch sheet. The writing is clear, concise, and appropriate for an academic setting. Everything except the last sentence is written in your own words and there is no cutting-and-pasting from course materials.

(7) The letter closes with your signature and your name, student number, e-mail address (U of T), and telephone number printed (word-processed) below it.

---

[4]The letter is the required documentation. I have found documents such as medical certificates unhelpful because medical professionals focus on serving their patients, not defending academic integrity at U of T.

Second Step: Give a signed hardcopy of your letter **in-person** to Prof. Murdock or a Head TA **no later than one week** after the missed work.

Third Step: Check your e-mail. If your excuse is deemed unacceptable you will be notified via e-mail within one week of the receipt of your letter. No e-mail is good news. If you wish to contest a rejected excuse you must do in writing and give a signed hardcopy of your follow-up letter **in-person** to Prof. Murdock or a Head TA within two weeks of the original missed term work and you should write the scheduled make-up test just in case your excuse is accepted.

Fourth Step: Write a cumulative make-up test. A missed make-up automatically earns a mark of zero. The make-up is on Thursday, Jan. 26, 4:10 - 6:00pm in GB 303 if you missed Term Test #1, the Midterm Test, or term work in the fall. The make-up is on Thursday, Apr. 5, 4:10 - 6:00pm in GB 303 if you missed Term Test #3 or term work in the winter. The mark on the missed work will reflect the make-up test result and, to a lesser extent, the quality of your letter.

9.5   TA Tutorial Quizzes

The TA tutorials mentioned in Section 6 may sometimes include mini-quizzes. The mini-quizzes give you an extra incentive to regularly study our course curriculum, provide an opportunity to learn, and help get you ready for term tests and our final exam. Some may be "graded" to provide formative feedback to you. These do not count directly towards your course grade but you should retain them as valuable study materials.

10   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 chapter in the first term and the remaining chapters in the second 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: Randomness and Probability (Excluding Section 6.9 Reversing the Conditioning: Bayes's Rule)
Chapter 7: Scatterplots, Association, and Correlation
Chapter 8: Introduction to Linear Regression
Chapter 9: Random Variables and Probability Distributions (Excluding Sections 9.7 The Poisson Distribution and 9.11 The Exponential Distribution)

Chapter 10: Sampling Distributions

Chapter 11: Confidence Intervals for Proportions (Excluding Section 11.5 A Confidence Interval for Small Samples)

Chapter 12: Testing Hypotheses About Proportions

Chapter 13: Confidence Intervals and Hypothesis Tests for Means

Chapter 14: Comparing Two Means

(Chapter 15: Paired Samples and Blocks (this chapter included if time permits))

Chapter 16: Inference for Counts: Chi-Square Tests (Only Section 16.5 Confidence Intervals for the Difference of Two Proportions)

Chapter 18: Inference for Regression

Chapter 19: Understanding Residuals

Chapter 20: Multiple Regression (Excluding Section 20.7 The Logistic Regression Model)

Chapter 21: Building Multiple Regression Models

In addition to the textbook there are two significant supplemental readings: we will provide you with hardcopies. One is described in Section 11 and the other is Chapter 1, "Economic Questions and Data," from *Introduction to Econometrics, Third Ed.*, 2011, by James H. Stock and Mark W. Watson (SW11). Other short required readings and handouts are provided throughout the course in either electronic or hardcopy format.

11   Attached Article: TK71

Attached to this syllabus 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 on pages 105 - 110 of Volume 76(2) of the *Psychological Bulletin.* We refer to it as "TK71." By the end of this course (both halves) you will be able to understand it and reproduce most of the calculations. But more than that, I hope that the way you think about probability, statistics, and randomness will be forever altered. As a first step, I will give you a reading guide to help with your first reading of it in preparation for a TA tutorial: watch for announcements.