

Quantitative Methods in Economics (ECO220Y1Y)

Fall 2008 / Winter 2009

Instructor: Prof. Murdock

Office: Economics Department: SS 4087 until move to 150 St. George, Room 312

Telephone: 416-946-0656 (if no answer, please leave a message clearly stating your name and repeating your telephone number twice)

Office hours: Wednesdays 2:30 - 4:30 (when classes are in session)

Appointments: You may make an appointment by telephoning

E-mail: I have found e-mail to be inappropriate for addressing concerns of students currently enrolled in my courses. Please do not expect a reply to e-mail. If you speak to me before or after class, in office hours or by telephone you *can* expect a reply.

Lectures: There are two identical sections:

Section L0301 Wednesdays 10:00-12:00 (EM 001) and Fridays 10:00-11:00 (EM 001)

Section L0401 Thursdays 10:00-12:00 (EM 001) and Fridays 11:00-12:00 (EM 001)

Course Web Site: <http://www.chass.utoronto.ca/~murdockj/eco220/>

TA Resources: See web site.

Excel Training: Instructor Christy Chen

1 Learning Objectives

Learning objectives help communicate course expectations to you. To make these meaningful and current, I review recent assessments to identify what we ask students to do.

- (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) Assess available data or propose a data collection plan to address a research question
- (3) Select a suitable quantitative approach to a “new” problem and apply it
- (4) Proficiently read output from various statistical software packages
- (5) Use Excel to conduct statistical analyses
- (6) Correctly interpret quantitative results for a non-technical or technical audience
- (7) Draw valid statistical conclusions and steer clear of common pitfalls
- (8) Explain what would change if a researcher made different choices or the data changed
- (9) Identify the underlying assumptions in quantitative analyses and figure out how violations affect conclusions and interpretations
- (10) Relate components within a statistical analysis and across our course
- (11) Critically evaluate an analysis or statement without being dazzled by numbers, data and jargon
- (12) Craft clear, concise and convincing written arguments

1.1 What does it mean to understand?

What does it mean to understand? Because there are different levels of understanding, this question must be answered specifically for our course. Superficial understanding can be feigned by memorization: memorizing definitions, explanations or relevant examples. While you will be expected to obtain some knowledge in this course, it is not enough: even if you could memorize all of the course material that would not imply a passing mark. Instead, examine the verbs in the learning objectives: these are what you are expected to do to demonstrate that you understand the material at the depth required by our course.

2 Academic Integrity and Respect

An important part of your university education involves always choosing to behave with integrity despite difficult and tempting situations. As explained in our *Code of Behaviour on Academic Matters*, academic integrity is a serious matter. Also, you are expected to respect your classmates and me. For example, during lecture do not chat, surf the Internet, read the newspaper, sleep, eat nor engage in any other disruptive behaviors.

3 Prerequisites

You are expected to know economics at an introductory level and to be able to solve problems using algebra, geometry and differential calculus. An administrator will ultimately remove you from our course if you do not have the prerequisites. Check yours: <http://www.economics.utoronto.ca/index.php/index/undergraduate/load/prerequisites> and http://www.artsandscience.utoronto.ca/ofr/calendar/crs_eco.htm.

4 Textbook

The required text is the 8th Edition of *Statistics for Management and Economics* by Gerald Keller (2008). It is available for purchase at the University of Toronto Bookstore. Copies of the textbook, Student CD-ROM, and the Instructor's Solution Manual are available for three-hour loan at the course reserves on the fourth floor of Robarts Library.

5 Course Web Site

I regularly maintain a course web site: <http://www.chass.utoronto.ca/~murdockj/eco220/>. Check it between class meetings.

6 Lecture Format, Repetition and Friday

Lectures are most often PowerPoint presentations. Students find it useful to visit the course web site early each week and print out the lecture slides to bring to that week's classes. Black and white or gray scale print outs are fine. You can then **take your own notes** directly on the print outs. Lecture slides are not lecture notes. Slides will be posted on the course web site no later than the Monday *before* lecture. The *same* lecture is delivered in Sections L0301 and L0401. Treat the Friday hour as lecture time and do not plan other activities during it. It is used for quizzes, teaching-assistant-led review sessions and possibly lectures.

7 Homework

Homework, which includes readings, exercises, Applets (CD-ROM) and problems, is posted on the course web site for each class meeting. A word of caution about solutions: when considering peeking at the solutions, remember graded assessments confront you with problems that you have not seen before. Allow yourself to practice getting started by using the solutions only to check your own best answers. Consider study groups.

8 Excel Training Sessions

Instructor Christy Chen (christy.chen@utoronto.ca) will give the required Excel Course Module (ECM) that complements our course. The ECM will start in October and you will have a chance to sign up for an Excel training session held in a computer lab. While seated at a computer, you will learn how to do statistical analyses using an augmented version of Excel. These help you prepare for Instructor Chen's graded Excel Test in March/April that you take in a computer lab. A link to the ECM web site will be posted.

9 Marking Scheme and Assessments

Your overall course mark is based on term work and a final exam. Because of the nature of our course material, assessments are cumulative. Multiple choice questions are used extensively but not exclusively. These permit more frequent testing, which promotes learning, and allow quick and accurate marking. The final exam, which Instructors Mazaheri, Yu and I will jointly compose, covers the entire course. Material from the second half of the course will account for roughly two-thirds to three-fourths of the exam and first half material the balance. All sections of ECO220Y1Y will take the same exact final exam. For the common final exam, the sections of the textbook you are responsible for are given at the end of this syllabus: these are the focus of our coursework.

For all assessments you may bring your own non-programmable calculator and you must bring your University of Toronto TCard.

Assessment	% Overall Course Mark	Length	Day, Date, Location, Time
Quiz # 1	10 %	50 min.	Friday, Oct. 10, EX 310/320, L0301: 10:10-11; L0401: 11:10-12
Quiz # 2	10 %	50 min.	Friday, Nov. 7, EX 310/320, L0301: 10:10-11; L0401: 11:10-12
Quiz # 3	10 %	50 min.	Friday, Dec. 5, MS 3154, L0301: 10:10-11; L0401: 11:10-12
Quiz # 4	10 %	50 min.	Friday, Jan. 23, EX 310/320, L0301: 10:10-11; L0401: 11:10-12
Quiz # 5	10 %	50 min.	Friday, Feb. 27, EX 310/320, L0301: 10:10-11; L0401: 11:10-12
Quiz # 6	10 %	50 min.	Friday, Mar. 27, EX 310/320, L0301: 10:10-11; L0401: 11:10-12
Excel Test	5 %	TBA	TBA (March - April)
Final Exam	35 %	3 hrs.	TBA (Apr. 20 - May 8)

If you **complete all six of the quizzes as scheduled above** then your best five quiz marks will be worth 12% each and your worst quiz mark will be worth 0%.¹ **All six quizzes are required:** incomplete quizzes obtain a mark of 0 that will be worth 10% of the overall grade. You will have 45 minutes to write each quiz: during the remaining 5 minutes you must remain silent, seated and with your writing instruments down while papers are distributed and collected. Students in Section L0301 cannot leave early and students in Section L0401 cannot arrive late.

9.1 Formula Sheets and Statistical Tables

For the quizzes and the final examination, formula sheets and statistical tables will be provided for you. These will be posted on the course web site at least one week ahead of the assessment so that you can familiarize yourself with them.

9.2 Grading

A machine marks multiple choice questions. Your mark and machine-read responses will be posted on the course web site as soon as possible after the quiz. For long answer questions handwritten marks include the points you earned and, if applicable, the following symbols.

¹If there is any doubt about a student's academic integrity or if there has been anomalous behavior for any quiz then this favorable re-weighting will not apply to that student. If it appears probable that a student's academic integrity has been compromised, I will alert the Office of Student Academic Integrity.

Symbol	Next to the part of your answer that is:
X	Incorrect
?	Logically unclear, confusing or illegible
\oplus	Imprecise or incomplete, which includes insufficiently showing work (Idea: “plus” more)
ϕ	Not relevant to question asked

Some comments may be addressed to the class either orally or in a written memorandum.

9.3 Re-grading

I accept applications for re-grades if it: (1) Is made IN WRITING and given to me along with your ENTIRE assessment, (2) Clearly specifies which questions were improperly marked and explains why, (3) Is submitted within four weeks. The entire assessment will be re-graded, not just the disputed parts. Your grade can go up, down, or remain unchanged. These conditions do not apply to clerical errors such as adding up your score wrong. If a clerical mistake occurs, please let me know as soon as possible.

9.4 Missed Term Work

Term work is an important component of our course. If you cannot complete the required work, you may consider re-taking this course when you are able. If missing a quiz cannot be avoided you are responsible for completing the following steps.

First Step: Contact me **BEFORE the missed quiz** either **by telephone or in person**. During our conversation we will set an appointment for an in-person meeting in my office, which will be within one week of the missed quiz. If you call and I do not answer, you are responsible for leaving a *clear message* on my answering machine that includes your name and a telephone number where I may reach you.

Second Step: At the appointment we have set, meet me in my office. We will use most of your 10-15 minute appointment for an **oral quiz** about the content of the course. If you are late for your appointment you will have less time to answer the questions.

Your oral quiz would count for 5% of your overall course grade and your final examination would count for 40%. The regular quizzes that you have taken with the class would each count for 10% of your overall course grade. This plan presumes that your academic integrity is intact. If I have concerns about your academic integrity then an alternate plan may be used at my discretion. Grave concerns would be directed to the Office of Student Academic Integrity.

Course Timetable:

Note 1: Lectures slides posted on course web site by the Monday BEFORE lecture.

Note 2: The same lectures are given in Sections L0301 and L0401.

Note 3: Homework assignments are posted weekly on the course web site.

Date: MM/DD			
L0301	L0401	Topic	
09/10	09/11	Introduction; Describing Data with Graphs (Chapter 1)	
09/17	09/18	Describing Data with Statistics (Chapters 1, 2 & 4)	
09/24	09/25	cont'd	
10/01	10/02	Data Collection and Sampling (Chapter 5)	
10/08	10/09	Probability (Chapter 6)	
Quiz #1	10/10 (Friday)	EX 310/320	L0301: 10:10-11; L0401: 11:10-12
10/15	10/16	Random Variables, Probability Distributions (Chapter 7)	
10/22	10/23	Discrete Probability Distributions (Chapter 7)	
10/29	10/30	Continuous Probability Distributions (Chapter 8)	
11/05	11/06	Sampling Distributions (Chapter 9)	
Quiz #2	11/07 (Friday)	EX 310/320	L0301: 10:10-11; L0401: 11:10-12
11/12	11/13	cont'd	
11/19	11/20	cont'd	
11/26	11/27	Estimation (Chapter 10 & Section 12.1)	
12/03	12/04	cont'd	
Quiz #3	12/05 (Friday)	MS 3154	L0301: 10:10-11; L0401: 11:10-12
12/06 - 01/04, No Classes: Winter Break			
01/07	01/08	Hypothesis Testing (Chapter 11)	
01/14	01/15	cont'd	
01/21	01/22	Single Pop.: Estimation, Hypo. Testing (Chapter 12)	
Quiz #4	01/23 (Friday)	EX 310/320	L0301: 10:10-11; L0401: 11:10-12
01/28	01/29	Two Pops.: Estimation, Hypo. Testing (Chapter 13)	
02/04	02/05	cont'd	

Date: MM/DD		
L0301	L0401	Topic
02/11	02/12	Simple Linear Regression (Chapter 16)
02/16 - 02/20, No Classes: Reading Week (02/16, <i>Last day to drop course</i>)		
02/25	02/26	cont'd
Quiz #5	02/27 (Friday)	EX 310/320 L0301: 10:10-11; L0401: 11:10-12
03/04	03/05	cont'd
03/11	03/12	Multiple Regression (Chapters 17 & 18)
03/18	03/19	cont'd
03/25	03/26	cont'd
Quiz #6	03/27 (Friday)	EX 310/320 L0301: 10:10-11; L0401: 11:10-12
04/01	04/02	cont'd
04/08	04/09	cont'd
Final Exam	04/20 - 05/08	University sets date, time, location

The course covers the following chapters in the required textbook: 8th ed. of Keller. We cover all sections *except* those the textbook labels “(Optional)” and those sections excluded below.

Chapter 1: What is Statistics?

Chapter 2: Graphical and Tabular Descriptive Techniques

Chapter 4: Numerical Descriptive Techniques

Chapter 5: Data Collection and Sampling

Chapter 6: Probability (Excluding Section 6.4 Bayes's Law)

Chapter 7: Random Variables and Discrete Probability Distributions (Excluding Section 7.5 Poisson Distribution)

Chapter 8: Continuous Probability Distributions (Excluding Chi-Squared Distribution)

Chapter 9: Sampling Distributions

Chapter 10: Introduction to Estimation

Chapter 11: Introduction to Hypothesis Testing

Chapter 12: Inference about a Population (Excluding Section 12.2 Inference about a Population Variance)

Chapter 13: Inference about Comparing Two Populations (Excluding Section 13.3 Matched Pairs Experiment and Section 13.4 Ratio of Two Variances)

Chapter 16: Simple Linear Regression and Correlation

Chapter 17: Multiple Regression (Excluding multicollinearity)

Chapter 18: Model Building