



**Bus Q600: Applied Business Statistics  
Fall 2013 Course Outline**

**Dr. Mahmut Parlar  
Operations Management Area**

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## **1 COURSE OBJECTIVE**

Statistics involves the study of collection, organization, presentation, analysis and interpretation of data. The ultimate goal of business statistics is business improvement through informed action when faced with uncertain outcomes. In this course we provide an introduction to some of the statistical analysis methods such as confidence intervals, hypothesis testing, experimental design and analysis of variance, and regression analysis to aid business decision-making.

## **2 PREREQUISITES**

- Registration in the first year MBA program at DeGroote School of Business.

## **3 SECTIONS**

<b>Sections</b>	Q600-EC01	Q600-C01	Q600-C02
<b>Time</b>	Tue: 19:00–22:00	Wed: 14:30–17:30	Thu: 11:30–14:30
<b>Class location</b>	RJC-214	RJC-214	RJC-214

## 4 INSTRUCTOR/CONTACT INFORMATION

### 4.1 Instructor

**Dr. Mahmut Parlar**

E-mail: <http://telecom.mcmaster.ca/directory.cfm>

Office: DSB-425 & RJC-222

Office hours: TBA

(905) 525-9140, Ext. 22858

<http://profs.degroote.mcmaster.ca/ads/parlar/index.html>

### 4.2 Teaching Assistants

Name	Email	Phone	Office
Jie Chu	TBA	TBA	TBA
Amirmohsen Golmohammadi	<a href="mailto:golmoha@mcmaster.ca">golmoha@mcmaster.ca</a>	x23584	TBA
Hangfei Guo	<a href="mailto:guoh24@mcmaster.ca">guoh24@mcmaster.ca</a>	x26385	TBA

## 5 COURSE WEBSITE

<http://profs.degroote.mcmaster.ca/ads/parlar/courses/q600/>

## 6 COURSE ELEMENTS

Credit Value:	3	Team Skills:	No	IT Skills:	Yes	Global:	Yes
ELM:	No	Verbal Skills:	No	Numeracy:	Yes	Political:	No
Participation:	Yes	Written Skills:	Yes	Innovation:	Yes	Social:	No

## 7 COURSE DESCRIPTION

This course introduces the methods of statistical analysis for managerial decision making. The computer is used as a tool and extensive use is made of statistical software package MegaStat (which is an Excel add-in).

The course provides a concise review of probability, descriptive statistics, random variables, and probability distributions. Application topics include sampling, confidence intervals, hypothesis testing, analysis of variance, simple and multiple regression and statistical decision theory.

## 8 LEARNING OUTCOMES

Upon completion of this course, students will be able to complete the following key tasks:

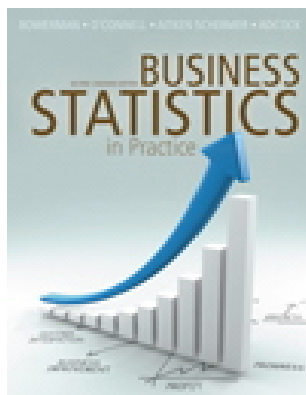
- Summarize a set of data by descriptive statistics,

- recognize the circumstances under which a situation could be described by a normal distribution,
- use the normal distribution to answer managerial probability questions,
- use sample results to make estimates of population parameters,
- use sample results to test theories about population parameters,
- use sample results from two (or more) sets of data to determine if there are differences between two (or more) population parameters,
- estimate the relationship between two (or more) sets of data,
- use the Excel add-in MegaStat to perform basic data analysis, to construct confidence intervals, to perform hypothesis tests, and to conduct regression analysis,
- interpret MegaStat output with respect to any of the above,
- use decision theory concepts (e.g., payoff tables, decision trees) to aid in managerial decision making.

## 9 REQUIRED COURSE MATERIALS and ONLINE LEARNING TOOLS

### 9.1 Required Text @ Mac Bookstore

- Business Statistics in Practice, 2nd Canadian Edition (2011), by Bruce L. Bowerman, Richard T. O'Connell, Julie Aitken Schermer, and James R. Adcock.



- **Hardcover version:** Shrink-wrapped with Connect Access Card which includes an eBook and registration code.
  - The access card will allow you to access the book's online system where you will be answering the assignment questions. You will also have access to the eBook which will be valid for one year.
  - Price: Approximately \$145 CAD

- **Connect Access Card:** Includes an eBook and registration code.
  - The access card will allow you to access the book’s online system where you will be answering the assignment questions. You will also have access to the eBook which will be valid for one year.
  - Price: Approximately \$89 CAD
- URL for the book web site is < [http://highered.mcgraw-hill.com/sites/0070000237/student\\_view0/index.html](http://highered.mcgraw-hill.com/sites/0070000237/student_view0/index.html) >.
- Also see < <http://www.mcgrawhill.ca/highereducation/products/9780071091404/> > for direct purchases from McGraw-Hill site.

## 9.2 Supplementary Online Learning Materials

- As indicated above, the text is shrink-wrapped with Connect Access Card. Connect is a web-based study program that includes a searchable eBook, chapter quizzes, interactive learning tools, **and most importantly, the online assignment questions. Do not throw away the Access Card!**
- IMPORTANT: You must register for the Connect assignment system **with only one e-mail**, i.e., the one assigned to you by McMaster University. Deviations from this will result in a penalty to be determined by the instructor.

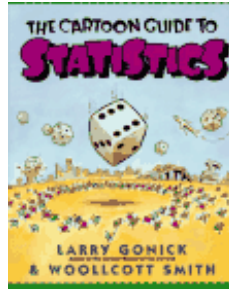
## 9.3 Software

- In this course we will use the Excel add-in MegaStat 10.2 (for Windows) and MegaStat for Mac that is available for download at < [http://highered.mcgraw-hill.com/sites/0070000237/student\\_view0/megastat\\_tutorials.html](http://highered.mcgraw-hill.com/sites/0070000237/student_view0/megastat_tutorials.html) >.
  - Refer to the contents of the `MegaStat.zip` (Windows) and `MegaStat.pkg.zip` (Mac) file for help in installing MegaStat.
- You should also install Visual Statistics 2.23 available at < [http://highered.mcgraw-hill.com/sites/0070000237/student\\_view0/visual\\_statistics.html](http://highered.mcgraw-hill.com/sites/0070000237/student_view0/visual_statistics.html) > which can provide additional insights into statistical analysis.

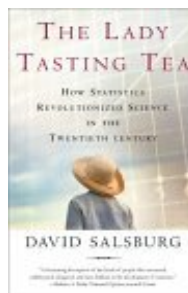
## 9.4 Suggested Reading

Here are three interesting books that you might enjoy reading in your spare time.

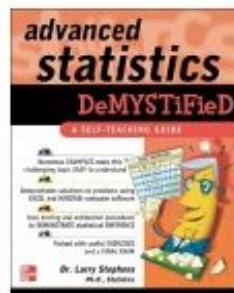
- Cartoon Guide to Statistics, by L. Gonick and W. Smith, 1993, HarperPerennial. (Just as the title says; statistics explained with cartoons.)



- The Lady Tasting Tea: How Statistics Revolutionized Science in the Twentieth Century, by D. Salsburg, 2001, W. H. Freeman and Company. (A book about the history and impact of statistics. Very easy and entertaining reading *without* any formulas.)



- Advanced Statistics Demystified: A Self-Teaching Guide, by L. J. Stephens, 2004, McGraw-Hill. (Simplified explanations of statistical inference concepts. Lots of examples.)



- Wikipedia article on statistics:

<http://en.wikipedia.org/wiki/Statistics>

## 10 EVALUATION

- There will be one midterm exam and one final exam.
- There will also be approximately six assignments and a project which uses real data.
- **The project will be distributed to the class after the midterm exam and it will be due on the day of the final exam.**

- The students are required to **type** their answers for the project problems in a formal report format and hand them to the instructor at the end of the final exam.
- **Submissions of the project by email WILL NOT BE ACCEPTED!**
- **Late submissions of the project after the final exam date WILL NOT BE ACCEPTED!**

## 10.1 Suggested Problems from the Textbook

The students are encouraged to solve the odd-numbered problems from the text for (most of) which the answers are available at the end of the book.

## 10.2 Components and Weights

The components of the course grade will be weighted as follows.

Component	Best of...		Tentative	Tentative
	Weight	Weight	Date and Times	Duration/Due date
Six assignments (approx.)	20%	20%	TBA	One week <sup>1</sup>
One project (real data)	15%	15%	TBA	Final exam day
Midterm	30%	25%	2013-11-08, Friday (19:00–)	2½ hours
Final	35%	40%	TBA	3 hours
TOTAL	100%	100%		

Note: The use of a calculator and the textbook is allowed during examinations in this course. See McMaster calculator policy at the following URL:

<http://www.mcmaster.ca/policy/Students-AcademicStudies/examinationindex.html>

## 10.3 Grade Conversion

At the end of the course your overall percentage grade will be converted to your letter grade in accordance with the following conversion scheme.

Grade (Points)	Percent
A+ (12)	90–100
A (11)	85–89
A– (10)	80–84
B+ (9)	75–79
B (8)	70–74
B– (7)	60–69
F (0)	0–59

<sup>1</sup>The assignments will normally be due one week after the completion of a specific chapter.

## 10.4 Communication and Feedback

Students that are uncomfortable in directly approaching an instructor regarding a course concern may send a confidential and anonymous email to the respective Area Chair or Associate Dean:

<http://mbastudent.degroote.mcmaster.ca/contact/anonymous/>

Students who wish to correspond with instructors or TAs directly via email must send messages that originate from their official McMaster University email account. This protects the confidentiality and sensitivity of information as well as confirms the identity of the student. Emails regarding course issues should NOT be sent to the Administrative Assistant.

## 11 COURSE SCHEDULE

- **Chapter 1: An Introduction to Business Statistics**

- Required reading: 1.1 to 1.3

- **▶▶▶ Chapter 2: Descriptive Statistics ◀◀◀**

- Required reading: 2.1 to 2.4

- \* EXCEPT THE COEFFICIENT OF VARIATION ON PAGE 54

- **★★★ Material in Chapter 2 (Sections 2.1 to 2.4 with the exception noted above) is required for all students but it will not be discussed in class. The instructor will provide a 3-hour session on the required material (voluntary to attend) on September 14, 2013 (Saturday) in the RJC Auditorium from 11:00–14:00. ★★★**

- **Chapter 3: Probability**

- Required reading: 3.1

- *Students should review 3.2 to 3.4*

- **Chapter 4: Discrete Random Variables**

- Required reading: 4.1 to 4.2

- *Students should review 4.3*

- **Chapter 5: Continuous Random Variables**

- Required reading: 5.1 to 5.3

- *Students should review 5.4*

- **Chapter 6: Sampling Distributions**

– Required reading: 6.1 to 6.2

**▶▶▶ Midterm Exam (Tentative) ◀◀◀**

• **Chapter 7: Confidence Intervals**

– Required reading: 7.1 to 7.6

\* EXCEPT THE UNEQUAL VARIANCE DISCUSSION IN THE BLUE BOX ON P. 238 AND MATERIAL RELATED TO IT (IN SECTION 7.6)

• **Chapter 8: Hypothesis Testing**

– Required reading: 8.1 to 8.5

• **Chapter 9: Statistical Inferences Based on Two Samples**

– Required reading: 9.1 to 9.4, and 9.6

\* EXCEPT THE UNEQUAL VARIANCE DISCUSSION IN THE BLUE BOX ON P. 296 AND MATERIAL RELATED TO IT (IN SECTION 9.3)

\* EXCEPT THE ONE-TAILED TEST ABOUT  $\mu_d$  DISCUSSION IN THE BLUE BOX ON P. 298 AND MATERIAL RELATED TO IT (IN SECTION 9.3)

\* EXCEPT THE UNEQUAL VARIANCE DISCUSSION AND THE ONE-TAILED TEST ABOUT  $\mu_d$  DISCUSSIONS IN THE BLUE BOXES ON PAGES 302 AND 303 (IN SECTION 9.4)

• **Chapter 10: Experimental Design and Analysis of Variance**

– Required reading: 10.1 to 10.2,

\* EXCEPT THE TUKEY SIMULTANEOUS INTERVALS MENTIONED ON P. 330 (IN SECTION 10.2)

• **Chapter 11: Correlation Coefficient and Simple Linear Regression Analysis**

– Required reading: 11.1 to 11.10

\* EXCEPT THE DURBIN-WATSON TEST ON PP. 404–408 (IN SECTION 11.10)

• **Chapter 12: Multiple Regression and Model Building**

– Required reading: 12.1 to 12.10.

• **Chapter 15: Decision Theory**

– Required reading: 3.5 and 15.1 to 15.2



## 12 ACADEMIC DISHONESTY

It is the student's responsibility to understand what constitutes academic dishonesty. Please refer to the University Senate Academic Integrity Policy at the following URL:

<http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf>

This policy describes the responsibilities, procedures, and guidelines for students and faculty should a case of academic dishonesty arise. Academic dishonesty is defined as to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. Please refer to the policy for a list of examples. The policy also provides faculty with procedures to follow in cases of academic dishonesty as well as general guidelines for penalties. For further information related to the policy, please refer to the Office of Academic Integrity at:

<http://www.mcmaster.ca/academicintegrity>

## 13 COPYRIGHT

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[http://www.copyright.mcmaster.ca/sites/copyright.mcmaster.ca/files/McMaster\\_Univ\\_2012\\_Agrmt\\_with\\_Acceptance\\_letter.pdf](http://www.copyright.mcmaster.ca/sites/copyright.mcmaster.ca/files/McMaster_Univ_2012_Agrmt_with_Acceptance_letter.pdf)

## 14 MISSED ACADEMIC WORK

### 14.1 Missed Mid-Term Examinations / Tests / Class Participation

Where students miss a regularly scheduled mid-term or class participation for legitimate reasons as determined by the MBA Academic Services Office, the weight for that test/participation will be distributed across other evaluative components of the course at the discretion of the instructor. Documentation explaining such an absence must be provided to the MBA Academic Services Office within five (5) working days upon returning to school.

To document absences for health related reasons, please provide the Petition for Relief for MBA Missed Term Work and the McMaster University Student Health Certificate which can be found on the DeGroote website at <http://mbastudent.degroote.mcmaster.ca/forms-and-applications/>. Please do not use the online

McMaster Student Absence Form as this is for Undergraduate students only. University policy states that a student may submit a maximum of three (3) medical certificates per year after which the student must meet with the Director of the program.

To document absences for reasons other than health related, please provide the Petition for Relief for MBA Missed Term Work and documentation supporting the reason for the absence.

Students unable to write a mid-term at the posted exam time due to the following reasons: religious; work-related (for part-time students only); representing university at an academic or varsity athletic event; conflicts between two overlapping scheduled mid-term exams; or other extenuating circumstances, have the option of applying for special exam arrangements. Such requests must be made to the MBA Academic Services Office at least ten (10) working days before the scheduled exam along with acceptable documentation. Instructors cannot themselves allow students to unofficially write make-up exams/tests. Adjudication of the request must be handled by the MBA Academic Services Office.

If a mid-term exam is missed without a valid reason, students will receive a grade of zero (0) for that component.

## **14.2 Missed Final Examinations**

A student who misses a final examination without good reason will receive a mark of 0 on the examination.

All applications for deferred and special examination arrangements must be made to the MBA Academic Services Office. Failure to meet the stated deadlines may result in the denial of these arrangements. Deferred examination privileges, if granted, must be satisfied during the examination period at the end of the following term. There will be one common sitting for all deferred exams.

Failure to write an approved deferred examination at the pre-scheduled time will result in a failure for that examination, except in the case of exceptional circumstances where documentation has been provided and approved. Upon approval, no credit will be given for the course, and the notation N.C. (no credit) will be placed on the student's transcript. Students receiving no credit for a required course must repeat the course. Optional or elective courses for which no credit is given may be repeated or replaced with another course of equal credit value.

Requests for a second deferral or rescheduling of a deferred examination will not be considered.

Any student who is unable to write a final examination because of illness is required to submit the Application for Deferred MBA Final Examination and a statement from a doctor certifying illness on the date of the examination. The Application for Deferred MBA Final Examination and the McMaster University Student Health Certificate can be found on the DeGroot website at

<http://mbastudent.degrootemcmaster.ca/forms-and-applications/>

Please do not use the online McMaster Student Absence Form as this is for Undergraduate students only. Students who write examinations while ill will not be given special consideration after the fact.

In such cases, the request for a deferred examination privilege must be made in writing to the MBA Academic Services Office within five business days of the missed examination.

Special examination arrangements may be made for students unable to write at the posted exam time due to compelling reasons (for example religious, or for part-time students only, work-related reasons):

- Students who have religious obligations which make it impossible to write examinations at the times posted are required to produce a letter from their religious leader stating that they are unable to be present owing to a religious obligation.
- Part-time students who have business commitments which make it impossible to write examinations at the times posted are required to produce a letter on company letterhead from the student's immediate supervisor stating that they are unable to be present owing to a specific job commitment.

In such cases, applications must be made in writing to the MBA Academic Services Office at least ten business days before the scheduled examination date and acceptable documentation must be supplied.

If a student is representing the University at an academic or athletic event and is available at an overlapping scheduled time of the test/examination, the student may write the test/examination at an approved location with an approved invigilator, as determined by the MBA Academic Services Office.

In such cases, the request for a deferred examination privilege must be made in writing to the MBA Academic Services Office within ten business days of the end of the examination period.

Note: A fee of \$50 will be charged for a deferred exam written on campus and a fee of \$100 for deferred exams written elsewhere. In cases where the student's standing is in doubt, the Graduate Admissions and Study Committee may require that the student with one or more deferred examination privileges refrain from re-registering until the examination(s) have been cleared.

## **15 STUDENT ACCESSIBILITY SERVICES**

Student Accessibility Services (SAS) offers various support services for students with disabilities. Students are required to inform SAS of accommodation needs for course work at the outset of term. Students must forward a copy of such SAS accommodation to the instructor normally, within the first three (3) weeks of classes by setting up an appointment with the instructor. If a student with a disability chooses NOT to take advantage of an SAS accommodation and chooses to sit for a regular exam, a petition for relief may not be filed after the examination is complete. The SAS website is:

<http://sas.mcmaster.ca>

## **16 POTENTIAL MODIFICATIONS TO THE COURSE**

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

## 17 PLACES YOU GET HELP WITH YOUR WORK

Teaching assistants will be available to help students in regularly scheduled office hours (TBA). In addition to this, the instructors will be available to answer questions **during office hours** (TBA).

## 18 CLASSROOM CONDUCT

**Please respect the following line of conduct in class in order to preserve a favorable learning environment:**

- Show up to class on time.
- Phones and beepers turned off; no leaving class for calls.
- Laptop use only for activities relevant to the lecture!
- No talking while the instructor is talking.
- Questions to be directed to the instructor.
- No reading materials unrelated to class.



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