MFin 604: Statistics for Financial Applications
Fall 2017 Course Outline

Dr. Mahmut Parlar
Operations Management Area

- Emails sent from non-McMaster accounts sometimes end up in my spam folder. So, you must use only your Mac account when communicating with me and the TA. We do not accept responsibility for non-Mac emails ending up in our spam folder.

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 turned off in class; no leaving class for calls!**
- **No laptop use in class!**
  - **Exception to this Rule: When I am demonstrating MegaStat/R, you can use your laptop, but once it's over, the laptop gets turned off!**
- No talking while the instructor is talking.
- Questions to be directed to the instructor.
- No reading materials unrelated to class.

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 Master of Finance program at the DeGroote School of Business.

3 SECTIONS

Sections	C01	C02
Time	Thursdays: 11:30–14:30	Fridays: 11:30–14:30
Class location	DSB-505	DSB-505

- Please note:
  - During the first and third weeks of the term, we will combine the two sections into one. That is, in Week 1 and Week 3, Section C01 and Section C02 classes will be held on September 16 and 30, 2017 (Saturday) in Room DSB AB-102 starting at 12:00 noon.
  - On October 5, 2017 (Thursday) we will vacate DSB-505 by 1:45 p.m.

4 INSTRUCTOR/CONTACT INFORMATION

4.1 Instructor

Dr. Mahmut Parlar

★ E-mail: `http://telecom.mcmaster.ca/directory.cfm`

Office: DSB-425

Office hours: TBA

1 (905) 525-9140, Ext. 22858

★ `http://profs.degroote.mcmaster.ca/ads/parlar/index.html`

4.2 Teaching Assistants

Name	**Email**	**Phone**
ManMan LI (Former MFin student)	`lim135@mcmaster.ca`	TBA

5 COURSE WEBSITE (reachable from. . .)

★ `http://avenue.mcmaster.ca/`

- Please upload a recent photo to Avenue.

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) and R with R Commander (Rcmdr).

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:

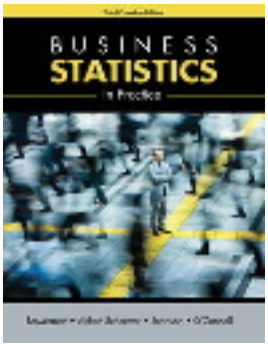
- Summarize a set of data by descriptive statistics,
- recognize the circumstances under which a situation could be described by a normal distribution,
- use the normal distribution to answer managerial probability questions,
- use sample results to make estimates of population parameters,
- use sample 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 and R & Rcmdr to perform basic data analysis, to construct confidence intervals, to perform hypothesis tests, and to conduct regression analysis,
- interpret MegaStat / R & Rcmdr output with respect to any of the above.

9 REQUIRED COURSE MATERIALS and ONLINE LEARNING TOOLS

9.1 Required Text @ Mac Bookstore

Business Statistics in Practice, 3rd Canadian Edition (2014), by Bruce L. Bowerman, Julie Aitken Schermer, Andrew M. Johnson and Richard T. O'Connell (and Emily S. Murphree).

- Book website: ★ `http://highered.mheducation.com/sites/0071339604/information_center_view0/index.html`



- **Purchase Options**
  - **Hardcopy version:**
    - Price: TBA. Used copies are also sometimes available.
  - **Connect Access Code:** If you decide not to purchase the hardcover version, you can just purchase the Access Code which includes an eBook and registration code.
    - The Access Code will allow you to access the book's online system where you will also have access to the eBook which will be valid for six months.
    - Price: TBA.
- Please go to the Bookstore link for these items to check their availability

  ★ `https://campusstore.mcmaster.ca/cgi-mcm/ws/txhome.pl?wsgm=coursematerial`

9.2 Software

- In Chapters 1 to 10, we will use the Excel add-in MegaStat 10.4 (available for Windows and Mac) that can be downloaded at <★ `http://highered.mheducation.com/sites/0071339604/student_view0/megastat_software.html` >. The link provides the following options for installations:
  - Windows versions of Excel 2016, 2013, and 2010.
  - Apple Mac versions for Mac Excel 2016 and 2011.
- In Chapters 11 and 12, we will use R, and R Commander (Rcmdr).

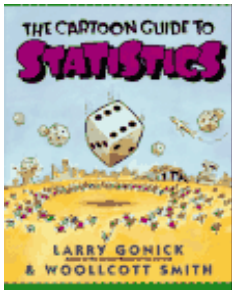
- I will show you how to install MegaStat and R/Rcmdr during the Transition Week.
- You should also install Visual Statistics 2.23 available at <★ `http://highered.mcgraw-hill.com/sites/0070000237/student_view0/visual_statistics.html` > which can provide additional insights into statistical analysis. This is an old software; it may not work on Windows 10! (But, it worked on Windows 7 and 8.)

9.3 *Suggested* Reading

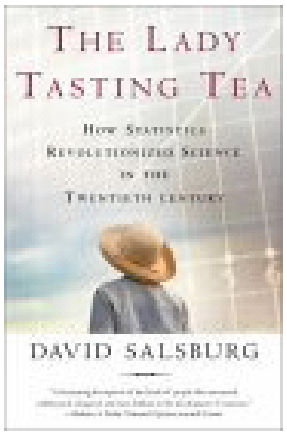
Here are four interesting books that you might enjoy reading in your spare time.

- Naked Statistics, by Charles Wheelan, 2013, W. W. Norton. (Strips the dread from the data!)

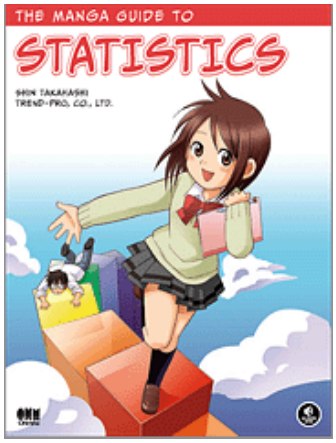
- Cartoon Guide to Statistics, by L. Gonick and W. Smith, 1993, HarperPerennial. (Just as the title says; statistics explained with cartoons.)



- 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.)



- The Manga Guide to Statistics, by Shin Takahashi, 2009. Trend-Pro Co. Ltd. (For those who like Japanese cartoons.)



- Wikipedia article on statistics:

★ `http://en.wikipedia.org/wiki/Statistics`

10 EVALUATION

- Ten Avenue quizzes from: [Chapters 1 and 2], 3, 4, 5, 6, 7, 8, 9, 10, 11.
- One midterm exam and one final exam.
- Four MegaStat/R project assignments which involve real data.
  - The students are required to **type** their answers for the project problems in a formal report format and submit them, **as a single file (.doc or .pdf),** via their Avenue account.
  - ✠ **Submissions of the project by email WILL NOT BE ACCEPTED!**
- ✠ **Late submissions of quizzes or the projects will not be accepted! Please make sure that you start working on these assignments well ahead of the deadline and don't wait until the last minute before submitting them.**

10.1 Suggested Problems from the Textbook

- Student Solutions Manual has several problems with complete solutions. Students should attempt as many of them as possible.

★ `http://highered.mheducation.com/sites/0071339604/student_view0/student_solutions_manual.html`

10.2 Components and Weights

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

Component	Weight	✠ Tentative Date and Times	✠ Tentative Duration/Due date
Ten Avenue quizzes	10%	TBA	One week[1]
Four projects using MegaStat/Rcmdr	10%	TBA	One week[2]
Midterm exam[3]	30%	2017-11-03, Friday, 19:00–	$2\frac{1}{2}$ hours
Final exam[4]	50%	2017-12-11, Monday, 19:00–	3 hours
TOTAL	100%		

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

★ `http://www.mcmaster.ca/policy/Students-AcademicStudies/examinationindex.html`

You are also allowed to bring with you 1 sheet (2 pages) of notes/formulas to the examinations.

10.3 Grade Conversion

At the end of the course your overall percentage grade will be converted and you will receive one of the letter grades listed in the table below.

But please note that I do **not** use a fixed percentage grading scale. That is, there is no fixed schedule that I use to map marks to letter grades. This means that raw marks are not in themselves very meaningful. Rather, your final grade will depend on how well you do **relative to other people** in your class.

[1] The quizzes will normally be due one week after posting them.
[2] The projects will normally be due one week after posting them.
[3] UH 213—Tentative.
[4] BSB 119 and BSB 120—Tentative.

Letter Grade
A+
A
A−
B+
B
B−
F

- Please note: I expect my students to attend all classes. I will take attendance at random intervals and your attendance record may influence your final mark.

10.4 Communication and Feedback

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.

11 COURSE SCHEDULE

Please note that *each chapter* will take *approximately 3 lecture hours* to cover. The numbers in the X.X format refer to the section numbers.

- **Chapter 1: An Introduction to Business Statistics**
  - Required reading: 1.1 to 1.4 (inclusive).
  - Note: Section 1.4 will be covered very briefly in class, but the students are expected to read it carefully on their own.
- **Chapter 2: Descriptive Statistics**
  - Required reading: 2.1 to 2.4 (inclusive)
  - Excluded: the coefficient of variation on page 54
- **Chapter 3: Probability**
  - Required reading: 3.1 to 3.4 (inclusive).
- **Chapter 4: Discrete Random Variables**
  - Required reading: 4.1 to 4.3 (inclusive).
- **Chapter 5: Continuous Random Variables**

- Required reading: 5.1 to 5.3 (inclusive).

- **Chapter 6: Sampling Distributions**
  - Required reading: 6.1 to 6.2 (inclusive).

✠ Midterm Exam (Includes Chapters 1–6; tentative date 2017-11-03, Friday, 19:00–)

- **Chapter 7: Hypothesis Testing**
  - Required reading: 7.1 to 7.4 (inclusive).
  - Note: Section 7.5 (Two-Sample Tests of a Difference between Proportions) will not be in the exam. But, if time permits, we will do an experiment in class to illustrate the basic ideas behind testing difference of proportions discussed in this section.

- **Chapter 8: Comparing Population Means and Variances Using t Tests and F Ratios**
  - Required reading: 8.1, 8.2 and 8.4.
  - Excluded: Any discussion related to Effect Size Estimation
  - Excluded: Any discussion related to unequal variances; pp. 273–274.

- **Chapter 9: Confidence Intervals**
  - Required reading: 9.1 to 9.5 (inclusive).
  - Excluded: the Paired Difference discussion box on p. 324.
  - Excluded: Any discussion related to Effect Size Estimation
  - Excluded: Any discussion related to unequal variances; pp. 323–324.

- **Chapter 10: Experimental Design and Analysis of Variance**
  - Required reading: 10.1 to 10.2 (inclusive).
  - Excluded: the Tukey simultaneous intervals mentioned on pp. 344–345

- **Chapter 11: Correlation Coefficient and Simple Linear Regression Analysis**
  - Required reading: 11.1 to 11.10.
  - Optional: The normal curve plot discussion on pp. 416–418.
  - Excluded: the Durbin-Watson test on pp. 419–425 (in Section 11.10)

- **Chapter 12: Multiple Regression and Model Building**
  - Required reading: 12.1 to 12.8 (inclusive) and 12.11.

12 ACADEMIC DISHONESTY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at:

`www.mcmaster.ca/academicintegrity`

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g., the submission of work that is not one's own or for which other credit has been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations

13 COPYRIGHT

McMaster University has signed a license with the Canadian Copyright Licensing Agency (Access Copyright) which allows professors, students, and staff to make copies allowed under fair dealing. Fair dealing with a work does not require the permission of the copyright owner or the payment of royalties as long as the purpose for the material is private study, and that the total amount copied equals NO MORE THAN 10 percent of a work or an entire chapter which is less than 20 percent of a work. In other words, it is illegal to: i) copy an entire book, or ii) repeatedly copy smaller sections of a publication that cumulatively cover over 10 percent of the total work's content. Please refer to the following copyright guide for further information:

★ `http://www.copyright.mcmaster.ca/sites/copyright.mcmaster.ca/files/McMaster_Univ_2012_Agrmt_with_Acceptance_letter.pdf`

14 MISSED ACADEMIC WORK

Late assignments will not be accepted. No extensions are available except under extraordinary circumstances. Please discuss any extenuating situation with your instructor at the earliest possible opportunity.

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 Student Experience 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 Student Experience Office within five (5) working days upon returning to school.

Students unable to write a mid-term at the posted exam time due to the following reasons: religious; 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 Student Experience 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 Student Experience.

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 Student Experience 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 an application for deferred final examination and a statement from a doctor certifying illness on the date of the examination. The request for a deferred examination privilege must be made in writing to the Student Experience 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). In such cases, applications must be made in writing to the Student Experience office at least ten business days before the scheduled examination date and acceptable documentation must be supplied.

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 ACKNOWLEDGEMENT OF COURSE POLICIES

Your enrolment in MFin 604 will be considered to be an implicit acknowledgement of the course policies outlined above, or of any other that may be announced during lecture and/or on A2L. It is your responsibility to read this course outline, to familiarize yourself with the course policies and to act accordingly.

Lack of awareness of the course policies cannot be invoked at any point during this course for failure to meet them. It is your responsibility to ask for clarification on any policies that you do not understand.

18 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).

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