MBA 7098 – Statistics and Data Analysis, Fall 2015

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Statistics and data analysis are probably playing the most important roles in business analytics nowadays. With the ability to conduct scientific statistical studies and systematically analyze data, managers will be able to understand more about their customers, suppliers, competitors, and the business environment. The insights may then facilitate better decision making and help a company to attain competitive advantages. In this fundamental course in the Global MBA (GMBA) program, we will focus on the techniques for conducting basic statistical studies and data analysis. The hope is that students will be capable of doing scientific data analyses in their future GMBA courses and after graduations. Time will be spent on tools, applications, as well as theories. Statistical software will be taught and used throughout this course. For at least part of this course, I plan to adopt the "flipped classroom" principle, which may be new to some students. Please pay attention to the syllabus to get an idea about the design of this course.

This is a required course offered in the GMBA program in National Taiwan University. The GMBA office does not allow non-GMBA students to take or audit this course.

Basic information

Instructor	• Ling-Chieh Kung (孔令傑). E-mail: lckung(AT)ntu.edu.tw.
	• Office: Room 413, Management Building II. Tel: 02-3366-1176.
	• Office hour: by appointment.
	• http://www.im.ntu.edu.tw/~lckung/.
Teaching Assistants	• Jeff Lee (李維哲). E-mail: r04725023(AT)ntu.edu.tw.
	• Share Lin (林怡安). E-mail: r04725037(AT)ntu.edu.tw.
Lectures	• 6:25-9:05pm, Monday in E-Sun Hall, Management Building I.
References	• Ken Black, 2011, *Business Statistics: For Contemporary Decision Making* (7th edition).
	• Steven Murray, *Learn R in a Day* (Amazon Kindle e-books only).
	• Steven Levitt and Stephen Dubner, 2009, *Freakonomics* (revised and expanded edition).[1]
	• Viktor Mayer-Schönberger and Kenneth Cukier, 2014, *Big Data*.[2]
On-line Resources	• For checking grades: CEIBA.
	• For materials: http://www.im.ntu.edu.tw/~lckung/courses/SDA15/.
	• For discussions: https://piazza.com/ntu.edu.tw/fall2015/mba7098/.

Grading

Breakdown	• Class participation: 10%.
	• Lecture problems: 10%. Homework: 20%.
	• Exams: "midterm 15% and final 15%" or "midterm 10% and final 20%"
	• Final project: 30%.
Conversion Rule	• The final letter grades will be given according to the following conversion rule:

Letter	Range	Letter	Range	Letter	Range	Letter	Range	Letter	Range
F	[0, 60)	C−	[60, 63)	C	[63, 67)	C+	[67, 70)	B−	[70, 73)
B	[73, 77)	B+	[77, 80)	A−	[80, 85)	A	[85, 90)	A+	[90, 100]

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[1] Translated into Chinese with the book title "蘋果橘子經濟學".

[2] Translated into Chinese with the book title "大數據".

Policies

"Flipped Classroom"
- Before most Monday lectures, the instructor will upload videos containing some materials to be discussed on that Monday. The total length of those videos for one lecture will be around 60 to 90 minutes. Students must find their own time to watch the videos before the lecture.
- During lectures, we answer students' questions regarding materials in the videos, give examples, do demonstrations, and provide lecture problems for students to do on-site analyses, problem solving, and discussions.
- Lecture problems will be graded on-site by the TAs.

Teams
- Students must form teams to do lecture problems and the final project. One's teams for these two activities will be different.
    1. Lecture problems: Students form teams with two to three students by themselves. A team will work together for lecture problems. One may have different teammates for each week.
    2. Final project: Students form teams by themselves. We expect each team to have four to six students, where the exact numbers will be determined after the class roster is finalized.

    In either case, if one does not want to form a team by herself, she may sign up as a free agent. Free agents will be randomly assigned teammates among them.

Homework
- To give students more chances to do practices, five homework assignments will be given. Solutions will be provided after the due dates. Each student needs to submit her own work.

Project
- Students will form teams to do a final project by applying the techniques learned in this course to a self-selected problem. Each team will make an oral presentation in one of the last two lectures and submit a report. The written report is due on the date the team makes the oral presentation. Unless a formal approval from the instructor is obtained, all team members must be in class for the team to present.

Class Participation
- We encourage class participation and include it in evaluating each student. During lecture time, students are more than welcome to ask or answer questions and provide comments. One gets good participation grades if her participation enhances the learning experiences of the class or she simply impresses the instructor with her passion and diligence.
- We will use http://www.piazza.com/ to do after-class on-line discussions. When one has any question, she is encouraged to post the question on the forum so that the whole class can benefit from the discussions. Of course, one may still choose to have private conversations with the TAs or instructor.

Office Hour
- You are welcome to have any kind of discussions with the instructor. You may ask him to clarify some concepts, give suggestions on case studies, or discuss the final project. Discussions not related to this course are also welcome. If you do not want to come in the designated time, feel free to send me an e-mail to schedule a meeting.

Exams
- The two exams will be in-class and open whatever you have (including all kinds of electronic devices). However, no information is allowed to be transferred among students. Cheating will result in severe penalty. The final exam is comprehensive.

Tentative schedule

Week	Date	Lecture	Reading[3]	What is due?
1	9/14	Overview, in-class brainstorming	Ch. 1	N/A
2	9/21	Descriptive statistics (1)	Ch. 2	N/A
3	9/28	***No class: Mid-autumn Festival***	N/A	N/A
4	10/5	Descriptive statistics (2)	Ch. 3	N/A
5	10/12	Probability theory (1)	Ch. 4	Homework 1
6	10/19	Probability theory (2)	Chs. 5 and 6	N/A
7	10/26	Distributions and sampling	Ch. 7	N/A
8	11/2	Distributions and sampling	Ch. 7	Homework 2
9	11/9	***Midterm exam***	N/A	N/A
10	11/16	Estimations	Ch. 8	N/A
11	11/23	Hypothesis testing (1)	Ch. 9	N/A
12	11/30	Hypothesis testing (2)	Ch. 10	Homework 3
13	12/7	Regression analysis (1)	Ch. 12	N/A
14	12/14	Regression analysis (2)	Ch. 13	N/A
15	12/21	Regression analysis (3)	Ch. 14	Homework 4
16	12/28	***Final exam***	N/A	N/A
17	1/4	***Project presentation 1***	N/A	Project report
18	1/11	***Project presentation 2***	N/A	Project report

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[3] Chapter numbers are based on *Business Statistics: For Contemporary Decision Making* by Black. However, one may find related chapters in almost all introductory business statistics textbooks.