MBA 7098: Statistics and Data Analysis, Fall 2016

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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. E-mail: lckung(AT)ntu.edu.tw.
- Office: Room 413, Management Building 2. Tel: 02-3366-1176.
- Office hour: by appointment.
- `http://www.im.ntu.edu.tw/~lckung/`.

Teaching Assistant. Daniel Zhihao Lee. E-mail: r04749037@ntu.edu.tw.

Lectures. 14:20-17:20pm, Wednesday in E-Sun Hall, Management Building 1.

References.

- (B) Ken Black, 2011, *Business Statistics: For Contemporary Decision Making* (7th edition).
- (M) Steven Murray, *Learn R in a Day* (Amazon Kindle e-books only).
- (LD) Steven Levitt and Stephen Dubner, 2009, *Freakonomics* (revised and expanded edition).
- (MK) Viktor Mayer-Schnberger and Kenneth Cukier, 2014, *Big Data*.

On-line Resources.

- To check grades: CEIBA.
- To download or link to materials: `http://www.im.ntu.edu.tw/~lckung/courses/SDA16/`.
- To discuss: Piazza (the URL will be announced later).

Grading

Breakdown.

- Not dropping this course: 10%.
- Class participation: 10%.
- Pre-lecture problems: 20%.
- Case studies: 30%.
- 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+	$[90, 100]$

Regrading. The TAs will grade everything except the project and regrade them upon request. If you have a regrading request, please contact the TAs directly.

Tentative schedule

Week	Date	Topic	Suggested Reading
1	9/14	Overview and in-class brainstorming	LD, MK, B Ch. 1
2	9/21	MS Excel operations (1)	
3	9/28	MS Excel operations (2)	
4	10/5	Exploratory data analysis (1)	B Ch. 2
5	10/12	Exploratory data analysis (2)	B Ch. 3
6	10/19	Probability	B Chs. 4–6
7	10/26	Case study (1)	
8	11/2	Distributions and sampling	B Ch. 7
9	11/9	Hypothesis testing	B Chs. 9–10
10	11/16	Regression analysis (1)	B Ch. 12
11	11/23	Regression analysis (2)	B Chs. 13–14
12	11/30	Project milestone	
13	12/7	Case study (2)	
14	12/14	Frequent pattern mining	
15	12/21	Classification	
16	12/28	Review and preview	
17	1/4	Final project presentations	
18	1/11	Final project presentations	

Note. For those chapters in B, one may find equivalent chapters in almost all introductory business statistics textbooks.

Policies

"Flipped classroom". The main idea of flipped classroom is "lectures in videos, discussions in classes." Before most Wednesday 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 do not count for grades; they are for the learning purpose only.

Pre-lecture problems. For each lecture that has lecture videos, there will also be a set of pre-lecture problems. While most pre-lecture problems are for you to practice by yourselves, one problem requires your submission. Solutions will be provided after the due dates. Each student needs to submit her own work. Copying will result in severe penalties for everyone involved.

Teams. Students must form teams to do lecture problems, case studies, and the final project. One's teams for these activities can be different. For lecture problems, each team should have three students unless a special approval is obtained. One may have different teammates in different weeks. For case studies, each team should have three students unless a special approval is obtained. One's teammates must be the same for different case studies. Finally, for the final project, each team should have about four to six students, where the exact numbers will be determined after the class roster is finalized.

Case studies. There are two case studies in this course. When a lecture is devoted to a case study, students will be given a problem set and a data set in class. They then work as teams to analyze the data and propose solutions to the problems. Some time will be left for some teams to present their solutions. Each team needs to submit a report summarizing their approach and solution afterwards. The grades mainly depend on the quality of the oral presentations and reports.

Attendance and 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 Piazza to do after-class on-line discussions. When one has any question, she/he 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. We do not require one to attend all the lectures. If you have something to do, feel free to drop a class.

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.

Final 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.