CAS MA 213
INTRODUCTION TO STATISTICS AND PROBABILITY

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OFFICE HOURS: by appointment.

MESSAGES: Email is definitely preferred. It is a lot easier to contact me via e-mail than any other means.

TEXT: McClave, Dietrich and Sincich: *Statistics.* 10^{th} *edition,* Prentice Hall.

NOTE: Bring the text to the class. You need a calculator for this course. A calculator that includes the following functions is desirable: x^2, $\sqrt{x}$, $\log_e$ or $\log_{10}$, e^x or 10^x, 1/x, +/-, y^x and at least one memory register. TI-83 is an excellent statistical calculator. However, it is somewhat expensive, and is not required for this course.

WHAT I EXPECT OF YOU?

- Regular attendance. Come to the class prepared and ready to ask questions.
- No unnecessary conversation during my lecture. If you have any question regarding the material being covered, I am a much better person to ask than the classmate sitting next to you.
- There is no such thing as a dumb question, but I will expect you to be prepared.

COURSE OBJECTIVES: Statistics is essential for proper collection, analysis and interpretation of data. In this course, you will be introduced to a collection of statistical techniques that are extremely useful for basic data analysis. In the beginning, we will discuss certain fundamental issues of data analysis, and develop probability models. At some points during the course, you may not fully understand how a particular topic fits into the overall objective of this course. This course builds on itself, and we will eventually put everything together. Also, note that this course may start somewhat slowly, but it picks up steam along the way.

LECTURE NOTES: I will be distributing the PDF version of my lecture notes. You will be able to download my lectures notes in various installments from web-links that will be announced in the class. It is imperative that you print the notes and bring it with you to the lectures.

HOMEWORK: Homework problems are shown in the course outline. These problems will not be collected, but they are an essential part of this course. It is important that you work on them. You may work on homework individually or in groups. Good group work is preferable to individual work: it allows the exchange of ideas among group members. However, if you work in a group it is important that everyone in the group actively participates; and not only understands but actually does all work produced by the group. The problems that are assigned will be enough for most of you to understand the material. However, if you need additional work, you can do other problems in the book. I would work out large number of the homework problems during my lectures, and discuss the homework problems that you had difficulty with. So please come to the class prepared.

EXAMINATIONS: There will be four exams in this course. All exams will be closed book and closed notes, and generally are not cumulative. Exams carry equal weights, and will take place according to the respective semester schedule:

Note that the exam schedule is subject to change, and any changes will be announced in class.

NOTES:

1. **BU has a strict policy against cheating and plagiarism. Any form of cheating or plagiarism, and disruptive activities during lectures, will not be tolerated.**

2. **All exams are required. Make up exams will be offered only under exceptional circumstances (medical reasons and family emergencies) when the following conditions are met:**

    a. **You must contact me BEFORE the exam to let me know that you will be missing the exam. If I am not available, send an e-mail or leave a message in the math office with your contact information. Be prepared to show positive proof related to your emergency.**

    b. **Be prepared to take the exam at the earliest available time at** my **convenience.**

    c. **Also, expect the make up exam to be generally more difficult than the regularly scheduled exam.**

3. **CAS students are expected to take CAS MA213 to fulfill their statistics requirement. If you are a CAS student taking this class, please check with your department/advisor to make sure that this class will fulfill your requirement.**

OUTLINE OF THE SYLLABUS:

Week	Chapter	Reading and Homework	Description
1	1	All sections	Statistics: Who needs it?
2 & 3	2	2.1-2.8 Hw1/Hw2	Graphical and Numerical description of data.
3 & 4	3	All sections Hw3	Basic ideas of probability and probability distributions.
5 & 6	4, 5	4.1-4.4 5.1, 5.3, 5.4 Hw4/Hw5	Discrete and continuous probability distributions.
7	6	All sections. Hw6	Sampling Distributions.
8 & 9	7	All sections. Hw6/Hw7	Interval estimation for mean and proportion. One sample case.
9, 10 & 11	8	8.1-8.5 Hw8	Hypothesis testing for mean and proportion. One sample case.
12 & 13	9	9.1-9.3, 9.5 Hw9	Estimation and hypothesis testing for two-sample inference.

List of Homework Problems

Hw1: 1.13, 1.15, 1.19, 1.20, 2.11, 2.31, 2.38
Construct a histogram of the dataset in problem 8.31 in page 382. Use 8.0 – 8.49, 8.5 – 8.99, etc. as your classes. Interpret the information conveyed through the histogram.

Hw2: 2.51, 2.57, 2.62, 2.64, 2.67, 2.74, 2.81, 2.94, 2.95, 2.97, 2.99, 2.100, 2.102, 2.112, 2.116, 2.134

Hw3: 3.14, 3.15, 3.19, 3.20, 3.30, 3.48, 3.49, 3.41, 3.51, 3.67, 3.69, 3.71, 3.73, 3.75, 3.82, 3.86, 3.120, 3.121, 3.123

Hw4: 4.3, 4.11, 4.12, 4.13, 4.31, 4.36, 4.39, 4.59, 4.60, 4.61, 4.62, 4.63

Hw5: 5.23, 5.25, 5.35, 5.36, 5.38, 5.40, 5.43

Hw6: 6.3, 6.35, 6.36, 6.39, 7.11, 7.13, 7.18, 7.35, 7.36

Hw7: 7.49, 7.51, 7.53, 7.70, 7.71, 7.72, 7.73, 7.75, 7.76

Hw8: 8.11, 8.13, 8.23, 8.25, 8.26, 8.27, 8.28, 8.29, 8.30, 8.61, 8.63, 8.64 (t=1.21), 8.66 (t=-1.79), 8.67, 8.78 (z=-2.16), 8.79, 8.81, 8.83, 8.87 (a).

Hw9: 9.14 (a) (0.29+/-1.452), 9.15, 9.16, 9.17, 9.26, 9.27, 9.42 (t=-1.08), 9.47, 9.58, 9.60 (z=3.16), 9.61, 9.6.