Math 243–Introduction to Probability and Statistics
Syllabus and Guidelines 2017-2018
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Textbook: *The Basic Practice of Statistics, 7th Ed.* by Moore. We typically cover chapters 1-3, 8-12 (maybe include 13 or 14), and 15-23.

The primary goal of the course is to have students be able to use and understand the basics of confidence intervals and hypothesis testing. In particular, they should be able to recognize the appropriate hypothesis test for a given situation (z-test, two-sample t-test, two-sample proportions, etc.), carry out such a test, and compute the corresponding confidence intervals. They should also be able to interpret such results for real-world applications. Finally, they should learn about how samples are collected and know some basic sources of systematic error in sampling and polling.

To achieve this goal, we must provide the basic tools and terminology (chapters 1-3), discuss how to collect data (chapters 8,9), give them a foundation in probability and sampling distribution (chapter 11-12 and maybe 13), and teach them about the various tests and confidence intervals (chapters 15-23). (Linear regression and correlation were dropped from the syllabus in 2016-2017 after consulting with the business school, economics department and psychology department.)

This material can be divided into four pieces. I would recommend that you move through chapters 1-3, 8, and 9 as quickly as possible (maybe 2.5 weeks). This leaves 2.5 weeks for discrete and continuous probability, and inference when the population standard deviation is known. The last time I taught this course, the chapters covered were as follows:

Week	Chapters covered	Week	Chapters covered
1	1,2,3	6	20
2	3,8,9	7	20,21
3	11,12	8	21,22
4	15,16,17	9	22,23
5	18, review, midterm	10	catch-up, review

With the schedule above I omitted chapters 13 and 14. Chapter 13 or 14 are chapters I would consider including in the future. I found that many students had difficulties understanding probability and how it relates to distributions. The specific material in chapters 13 and 14 is not necessary but a stronger background in probability is desirable.

The second caution I would make is about the use of TI-83/84 calculators. There are some rather complex formulas in the course that your students will not (should not) compute by hand. However, I found that if you leave them to their own devices, they cannot figure out how to use their calculators correctly. Clearly, we don't want the course to be a button punching course but many students cannot do some problems because they cannot do the computations by hand and they don't know how to use their calculators. It takes a lot of effort to find a nice balance and write exams that cannot be exploited by button pushing.

Excel: I choose to teach students how to use Excel to do their computations. In addition to the webwork, I have students complete an Excel worksheet each week by submitting an Excel

file via Canvas in which they have solved two problems from the worksheet. I prefer teaching them how to use Excel rather than their TI-83/84s. This means you have to be using Excel in class with a computer and projector and you have to write exams that do not need to power of a fancy calculator. For example, I cannot ask them to compute sample standard deviation on an exam. If you are interested in using Excel in your section of math 243, please feel free to contact me and I can give you more details about it.

The last point to note is that **the business school requires that their applicants take Math 241, 242, and 243 for a grade in order to satisfy the entry requirement to the college**.