

Math 243–Introduction to Probability and Statistics
Syllabus and Guidelines 2014-2015
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Textbook: *The Basic Practice of Statistics, 6th Ed.* by Moore. We typically cover chapters 1-5, 8-11 (maybe include 12), and 14-21 (possibly excluding 17).

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 1-5), discuss how to collect data (chapters 8,9), give them a foundation in probability and sampling distribution (chapter 10-11 and maybe 12), and teach them about the various tests and confidence intervals (chapters 14-21).

This material can be divided into four pieces. I would recommend that you move through chapters 1-5, 8, and 9 as quickly as possible (maybe 2.5-3 weeks). This leaves 1-2 weeks for discrete and continuous probability. Finally, give yourself a full 5 weeks for confidence intervals and hypothesis testing. The last time I taught this course, the material covered was as follows:

<u>Week</u>	<u>Chapters covered</u>	<u>Week</u>	<u>Chapters covered</u>
1	1,2,3	6	15, midterm
2	4,5	7	16,18
3	8,9,10	8	18, 19
4	11,14	9	20,21
5	14,15	10	21, review

With the schedule above I omitted chapters 12, 13 and 17. Chapter 12 is a chapter I would consider including in the future because it would allow me to spend more time developing their foundation in probability. I found that many students had difficulties understanding probability and how it relates to distributions. The specific material in chapter 12 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: Recently I have begun teaching 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 Blackboard 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 linear correlation 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 beginning in fall 2010, **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.**