Stats 345
Elements of Mathematical Statistics and Probability

Basic Course Information

Course:	Stats 345	MITCH 102	TuTh	12:30–1:45pm	
Instructor:	Fletcher Christensen	Assistant Professor of Statistics			
Contact:	ronald@stat.unm.edu	http://www.stat.unm.edu/∼ ronald/			
Office Hrs:	SMLC 328	Tu 3:30–5:00	Fr 11:00–12:30		
Discussion:	DSH ???	Mo 5–6	Tu 4–5	We 5–6	Th 4–5
Website:	http://www.stat.unm.edu/ ronald/stat345.html				
Prerequisites:	MATH 163 or MATH 181 (Integral Calculus)				

Course Summary

This is a course about uncertainty: how to express it, how to understand it, and how to deal with it. Probability is a mathematical technique for quantifying uncertainty. Statistics teaches us how to draw reliable conclusions when faced with uncertainty. Together, these elements form the foundation of modern scientific inquiry. We will spend the first half of the semester learning about probability rules and common probability distributions. In the second half of the semester, we will apply what we've learned about probability to real-world data. We will finish the semester by discussing how probability and statistics can be applied to quality control.

Texts and Resources

The material in this course will be based primarily on lectures, but if you would like textbook recommendations to assist your learning, I would suggest the following:

- *Applied Statistics and Probability for Engineers, 6^{th} ed.* by Montgomery & Runger – Historically, we have often used this textbook for STAT 345, but instructors for this class often choose to prioritize material a little differently. This textbook is at the same level as the course, however, and can be a good additional resource.
- *Statistical Inference, 2^{th} ed.* by Casella & Berger – This is the classic statistics book on probability and inference, used by higher level courses at UNM. The notation we use in this class will be based Casella-Berger notation. For a deeper understanding of the topics we discuss, I recommend this book.

In addition to lectures and recommended textbooks, we offer discussion sections for STAT 345 where you can go to get additional help. These discussion sections will be led by our graders and will provide a review of the previous week's material in the form of supplemental lectures, activities, and/or answering questions.

Assessment

There will be three components to your grade in this class:

1. Assignments (50%)

   We will have a number of homework assignments for this class. These will correspond with the primary topics of the class: basic probability rules, discrete probability distributions, continuous probability distributions, summarizing data, estimating parameters, and statistical testing. You can expect one assignment about every 2-3 weeks. We'll take a break from assignments for the midterm and Spring Break around the middle of the class.

2. Midterm Exam (25%)

   The midterm exam will be held on **Tuesday, March 10$^{\text{th}}$**. The focus of this exam will be on the basic laws of probability and probabilistic modeling of random variables. There may or may not be a practice exam to look at, but the homework assignments should give you a good idea of what topics I think are important to cover.

3. Final Exam (25%)

   The final exam will (probably) be held on **Thursday, May 10$^{\text{th}}$, from 10:00am to 12:00pm**. You will be expected to know the material on probability from the first half of the course; but the exam will primarily deal data summaries, estimation, testing, and quality control. Again, it is possible that there will be a practice exam to look at, but regardless you should be able to get a sense for what the exam will cover by reviewing the homeworks and midterm.

Policies and Expectations

Class attendance:

You are responsible for knowing material covered in class. Attendance is not mandatory and will not be checked, but it is very strongly encouraged. Attendance of discussion sections, as well, is encouraged although not mandatory.

Be respectful to your fellow students in class. Keep your cell phones and laptops muted. If you know you'll have to arrive to class late or leave early, try to sit near the doors so you can minimize the disturbance you cause.

Missed exams:

If you're in danger of missing an exam (e.g. if you're sick, or if you get into a car accident on the way to school), *contact me by email ASAP*. If I'm aware of the issue, I can make arrangements for you to take the exam at an alternate time. But if you miss the exam without contacting me about your situation, I *will* give you a zero on the exam.

Students with disabilities:

In accordance with University Policy 2310 and the American Disabilities Act (ADA), students who need academic accommodations and/or assistance in emergency evacuations should contact me as soon as possible to ensure their needs are met in a timely manner.