Course Outline

STAT 24400 Statistics Theory and Methods I
Winter 2016; TTh 3:00-4:20; 120 Kent

Required Text: *Mathematical Statistics and Data Analysis*, John A. Rice, THIRD edition, Duxbury 2007 ISBN 0-534-39942-8. We will also make use of an excellent set of typeset notes by Prof. Stigler. These will be posted on chalk.

Material and Prerequisites. This is the first quarter of a two quarter sequence, of which the second half is STAT 24500. 244 is the more theoretical half of the pair. We allow but do not recommend taking 244 alone—it is not a full introduction to statistics and should be followed by 245 or an alternative. Roughly, the plan is to cover chapters 1-5, 8, and 9 of Rice with certain additional special topics at the end of the quarter as time permits. Hence the topics we will cover include the definitions of probability and random variables, binomial and other discrete probability distributions, normal and other continuous probability distribution, joint probability distributions and the transformation of random variables, principles of inference, maximum likelihood estimation, hypothesis testing and confidence intervals, likelihood ratio tests, multinomial distributions chi-square tests, and categorical data analysis.

There are no formal prerequisites for this class. Nevertheless, we expect that you have previous experience with probability (STAT 25100 is more than enough, for instance). For this reason a Homework Zero is assigned TODAY and is due Thursday, January 7, when the solution will be posted (see 'HW0' below). I expect to cover Chapters 1, 2, 3.1-3.5, and 4.1-4.3 in the first three lectures. *Hence these chapters and sections constitute your reading assignment for the next week.* Future reading assignments will be posted on chalk. We will make extensive use of partial differentiation and integration. There won't be much linear algebra in 244, but it is heavily used in 245. Look at Rice and the problems therein to get an idea if you are in the right place. If you are still wondering which STAT class is right for you, our Director of Undergraduate Studies, Linda Collins (`lcollins@uchicago.edu`; E107), is available for consultations on this topic.

Homework, Exams, and Grades. Homework will be posted on `chalk.uchicago.edu` every Thursday, and will be due the following Thursday. Homework is due **in hardcopy at the beginning of class.** *Write your name on your homework and staple it together.* Homework can be handwritten or typeset by computer. Solutions will be posted the day the homework is due. Late HWs and emailed HWs will **not** be accepted. Note, however, that your lowest homework grade will be discarded. We strongly encourage collaboration and discussion of homework, but the HW you turn in must be completed entirely by you. Duplication of solutions in whole or in part is considered plagiarism; that includes duplication from the internet or former 244 students.

HW0. There is a special HW assignment, HW0, that you should download from chalk *today* because it is due Thursday, January 7. You are not to collaborate on this HW *only*. This HW will help you see if you should be in 244, and it will help me get to know you since I will personally grade it. It will *not* count towards your final grade.

~~There will be a midterm on Thursday, February 4 from 3:00PM to 5:00PM~~. **The midterm will be from 4:30PM to 6:30PM, Thursday February 4, in 107 Kent.** The final will be be from 1:30PM to 3:30PM on Tuesday, March 15. ~~These exams will probably be held in K120, but~~ Watch chalk and your email for possible changes. You may bring a single sided page of notes to the midterm, and a two-sided page of notes to the final. Constructing these notes is an important part of studying for the exam. Bring a scientific calculator to both exams. If you don't have one, get one—such calculators are inexpensive. You are not permitted to have an active communication device during the exam, so you won't be permitted to use a software calculator on a phone or laptop.

Grades will be based on 50% final, 25% midterm, and 25% homework.

Problem Session and Discussion Groups. There will be two weekly problem sessions on Wednesday in E133. One will go from 1:30PM to 2:20PM (Li and Roy), and the other will be from 7:00PM to 8:00PM (Qi and Kim). These will start on January 13. In addition, there will be drop in office hours as described below.

We will make use of the chalk discussion groups to answer questions, with reasonable response times. You are encouraged to ask questions there. You may email us at any time, of course. If you email us a question about a statistics point of general interest, we may post your email and our answer in the discussion forum.

Contact Info:

Role	Name	Email
Instructor	John Reinitz	reinitz@galton.uchicago.edu
Course Assistant	Byol Kim	bkim@galton.uchicago.edu
Course Assistant	Eileen Li	ejli@galton.uchicago.edu
Course Assistant	Yuxue Qi	yuxue@galton.uchicago.edu
Course Assistant	Rishideep Roy	rishideep@galton.uchicago.edu

Office Hours:

Instructor Office Hours:	Monday 3-4PM and Weds 11:00AM-noon, E134
Kim Office Hours:	Mon 11:00AM-noon, E131
Li Office Hours:	Mon 3:00-4:00PM, E131
Qi Office Hours:	Tues 5:00-6:00PM , E131
Roy Office Hours:	Tues 6:00-7:00PM , E131
Can't make office hours?	Email for an appointment!