

MT427 Mathematical Statistics
Spring 2011
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Mathematical Statistics is a continuation of MT426 Probability or an equivalent (calculus-based) probability course. Whereas probability takes a given distribution and calculates the probability of seeing certain data values, statistics takes data and attempts to find the distribution that generates it, estimate parameters of the underlying distribution, and test hypotheses about those parameters.

Some of the topics we'll be covering this semester are: the central limit theorem, maximum likelihood estimation, method of moments estimation, confidence intervals, minimum-variance estimators, Cramer-Rao lower bound, sufficiency and consistency of estimators, hypothesis testing: binomial parameter, t test, Z test, generalized likelihood ratio, inferences about variances, two sample problems, goodness-of-fit tests, tests of independence and homogeneity, and nonparametric statistics.

Text: An Introduction to mathematical statistics and Its Applications, 4th Edition, by Richard Larsen and Morris Marx. We'll cover chapters 5-7, 9, 10, and some of 14.

Prerequisite: MT202 and MT426 or equivalent courses.

How to reach me: my office is **365 Carney; 617-552-3769**; email (chambers@bc.edu) is probably the most reliable method of reaching me.

Office hours: Monday 10-11, Wednesday 11-12, Friday 1-2, or by appointment.

Homework will be assigned and collected on a weekly basis. I will return correct solutions with your papers and you should look over any mistakes and make sure you understand the solutions.

If you are having trouble with the homework problems, I'm available for assistance and hints. You are also allowed to discuss the problems with other students, but **you alone are to write up your work**; discussion with other students is simply to understand the concepts and techniques so that you can solve the problems. **Papers containing transparent copying will be returned with zero credit.** Late homework will generally not be accepted. University procedures will be followed in integrity cases; see www.bc.edu/integrity for these.

Exams: there will be two semester exams and a cumulative final. You are only allowed a make-up for a missed exam for a serious reason. If you must miss one, please clear it with me beforehand. Exams are closed-book, except that you may bring in one standard size sheet of paper with whatever you can fit on it. Tentative dates for the semester exams are Exam 1: Monday, **February 21**; Exam 2: Monday, **April 4**. The final will be held on Saturday, **May 14** at 12:30 pm.

Semester grades will be based on homework (15%), semester exams (27.5% each), and final exam (30%).