

Mathematical Statistics I: Distribution Theory

Instructor: Steve Kachman
Office: 355B Hardin Hall
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Office Hours: I will generally be available in the afternoon

Textbook: *Statistical Inference*, 2nd edition; Casella and Berger, 2002
References: *Introduction to Probability and Mathematical Statistics*, 2nd edition; Bain and Engelhardt, 1992.
Introduction to Mathematical Statistics, 5th edition; Hogg and Craig, 1995.
Introduction to Probability Theory and Statistical Inference, 3rd edition; Larson, 1982.

Prerequisites: MATH107H or MATH208 (Calculus III), or the equivalent.

Grading:

Homework	20%
Exam I	25%
Exam II	25%
Final Exam	30%

A final average of 90% will guarantee an A-, 80% a B-, 70% a C- and 60% a D-.

Available at <http://my.unl.edu/>

Homework: Approximately 12 homework assignments will be made over the course of the semester. You will always have at least a week to work on each of the assignments. The only way to learn statistics is to practice working problems, and homework is therefore an essential part of the course. Late homework should be avoided in all but the most dire emergencies.

Exams: Exams are closed book and notes. You are expected to take exams at the scheduled times. If this is impossible due to extreme circumstances (illness, death in the family, previously scheduled activities vital to academic program), please notify me. No make-up exams will be given if I am not notified prior to the examination. You will be required to obtain a note from your physician or advisor explaining the nature of the conflict.

Final Exam: The final is scheduled for **Monday, December 11th from 10:00 - Noon**. This exam is also closed book and notes.

Web page: <http://statistics.unl.edu/faculty/steve/882/2006/>

TENTATIVE COURSE OUTLINE

Week	Day	Topic
Aug. 22	Tues Thurs	Set theory; Venn diagrams; Borel fields Probability theory; counting
Aug. 29	Tues Thurs	Conditional probability; independence; Bayes' rule Random variables; distribution functions
Sep. 5	Tues Thurs	Density and mass functions Bivariate CDFs; independence
Sep. 12	Tues Thurs	Transformations Probability integral transformations
Sep. 19	Tues Thurs	Expected values Moments; variance
Sep. 26	Tues Thurs	MGFs EXAM 1
Oct. 3	Tues Thurs	MGFs; central and non-central moments; PGFs; CHFs Discrete distributions
Oct. 10	Tues Thurs	Continuous distributions Continuous distributions
Oct. 17	Tues Thurs	FALL BREAK Exponential families; multiple random variables
Oct. 24	Tues Thurs	Marginals; independent RVs; conditional distribution Conditional density; conditional mean and variance
Oct. 31	Tues Thurs	Multivariate MGFs; bivariate transformations Non 1-1 transformations; covariance; correlation
Nov. 7	Tues Thurs	Bivariate normal distribution EXAM 2
Nov. 14	Tues Thurs	Joint distributions Inequalities
Nov. 21	Tues Thurs	Random samples; sums of random variables THANKSGIVING BREAK
Nov. 28	Tues Thurs	Convergence Sampling from a normal distribution
Dec. 5	Tues Thurs	Delta-method Review