

Syllabus for Second Semester of Probability and Statistics
Math 242 at Queens College

The text we are using is Probability and Statistical Inference by Hogg, Tanis and Zimmerman 9th ed. published by Pearson.

List of Topics

Descriptive Statistics (both by hand calculations and using the TI-83 or 84): Stem and Leaf Plot, Histogram, Tukey 5 number summary, (modified) Box and Whisker Plot

Review of old probability distributions and pdfs from last semester; review of the Central Limit Theorem

Moment Generating Functions and using them to derive the mean and variance for the old distributions

Some new pdfs: Gamma Distribution (and its relation to last semester's exponential distribution) which leads to the Chi-Square and F distributions; the T distribution. Include proofs which show students how calculus can be used to prove theorems in statistics, e.g. show that the square of the standard normal distribution is the chi square distribution.

Simple applications of the above Sampling Distributions

Estimation: point estimation (make sure to cover unbiased estimators and why we divide by "n-1" instead of "n" in the formula for sample variance) and interval estimation for mean, differences of means (for both large and small samples), variance, quotient of variances, proportions, difference of proportions

Tests of Hypotheses: for means, variances, proportions

Chi Square Goodness-of-Fit Test

Simple Linear Regression and, if there is time, Analysis of Variance