Exam #2 notes

Theme: randomness
Text: Chapters 3 and 4 (except 4.5)
Bring: calculator, 3" x 5" index card with formulas
Will get: Tables A,B

Below is one way you might organize the material for this exam. Note that this paints a big picture without all of the smaller details.

1. Understanding randomness with probability
   - Probability: proportion of an outcome among infinitely many repetitions of a random process
   - Basic rules
     - probability of event and probability of complement add to 1
     - add probabilities for OR of disjoint events
     - multiply probabilities for AND of independent events
   - Random variable: quantitative variable with values determined by random process
     - mean, variance, and standard deviation (definitions and rules)
     - law of large numbers

2. Application: using randomness to control for unmeasured variables
   - Random assignment in experiment
   - Random selection in sampling

3. Application: randomness in selection of sample to get statistic as estimate of parameter for population
   - statistic (such as sample mean or sample proportion) for a simple random sample is a random variable
   - sampling distribution: values of a statistic for all possible samples of a given size
   - sampling bias and sampling variability key to understanding statistic as estimate of parameter (in ways to be made precise in remainder of the course)