Probability

- computing the probability of an event (permutations, combinations, union, intersection, etc.)
- conditional probability (compute and interpret)
- independence
- Bayes' theorem

Random Variables

- discrete vs. continuous
- pdf and cdf
- calculating probability of events from the pdf and cdf
- expected values
- moment generating functions
- multivariate versions of all of the above
- conditional distributions and conditional expectations, $E[Y|X]$
- covariance and correlation
- independence
- named distributions:
  * Bernoulli, binomial, geometric, multinomial
  * Poisson (including approximation to binomial, Poisson process)
  * exponential, gamma, chi-square
  * uniform
  * cauchy
  * normal (including bivariate and multivariate, and the distribution of $\overline{X}$ and S^2, linear combinations of X_i's)
  * beta
  * t
  * F
- transformations (cdf method, Jacobian, MGF method)
- statistics, order statistics, random samples
- convergence:
  * in distribution
  * in probability
  * WLLN, SLLN
  * MGF's, Slutsky's theorem
- Central limit theorem
- delta method