- Sections 6.10-6.12, Chapter 8: means from independent samples
  - How to write statements of hypotheses
    Note: For 2-sample mean, $\mathbf{H}_0: \ \mu_1 - \mu_2 = 0$ is preferred over $\mathbf{H}_0: \ \mu_1 = \mu_2 = 0$
  - How to compute various entries for a partially-populated ANOVA table
  - Using a reference t or F-distribution to obtain a P-value or a critical value separating rejection from non-rejection region
    * rules for determining when is it appropriate
    * how to determine which one
    * R commands such as `qt()`, `pt()`, `qf()`, `pf()`, `anova(lm(...))`, `TukeyHSD()`
  - Following up a significant ANOVA result using `TukeyHSD()`
- Chapter 7: Categorical data
  - Frequency and two-way tables contain observed counts
  - How to write null and alternative hypotheses
    * univariate case (goodness-of-fit testing)
    * bivariate case (test for association)
  - How to produce expected counts in both univariate/bivariate cases
  - Calculating the χ^2-statistic
  - Using a reference chi-square distribution to obtain a P-value or a critical value separating rejection from non-rejection region
    * rules of thumb for determining when is it appropriate
    * how to determine which one
    * R commands such as `qchisq()`, `pchisq()`, `chisq.test()`, `tally()`, `matrix()`
  - How to obtain an approximate null distribution, and use it to obtain a P-value
- Chapter 9: Regression inference
  - Simple Linear Model (SLM) assumptions, and diagnostic plots to check if badly off
  - Model utility
    * Stating hypotheses (more than one way to do it)
    * Appropriate test statistics (t, F), and how to find a corresponding P-value
    * R commands that generate useful output, and understanding that output: `gf_point()`, `gf_lm()`, `cor()`, `lm()`, and commands that further process its output like `residuals()`, `fitted()`, `summary()`, `anova()`, `makeFun()`, `mplot()`
  - Coefficient of determination R^2
    * interpreting it
    * its relationship to the correlation coefficient
    * ways to calculate it
  - interval estimates: constructing and interpreting them
    * confidence intervals for β_1 (β_0?)

    * confidence interval for the mean response at a set value of the predictor variable
    * prediction interval for a (future) response at a set value of the predictor variable

- Don't let fall through the cracks as you study
  - Problems which have been assigned, problems that have been gone through as examples in class, skill-builder problems in the Lock5 text
  - **Recognition of context**: Details are important, yes; it may well cost you a few points if you use $df = n-1$ in settings where it should be $df = n-2$. But, it is even more costly when a student applies ANOVA in a setting where a χ^2-test of association is called for. For Midterm 3 (and even more, for the final exam), selecting a correct method for analyzing data is greatly important.
  - **Statement of Hypotheses**: Be able to state appropriate hypotheses in all situations where a test of hypotheses is called for. You should always have clear in your mind what two *calls* are possible as you begin the steps of an hypothesis test.
  - **Assumptions validating a procedure**: We have used theoretical distributions to go from test statistic to P-value (or from point estimate to confidence interval). But we have also used simulations. Be able to identify those things which would call into question the theoretical-distribution results, and to discuss plots and rules of thumb appropriate to a context.
- Once again, calculators are allowed, but you must show work that boils all calculations down to basic calculator operations: $+$, $-$, $\times$, $\div$, $\sqrt{\ }$. (Expect deductions when you have used functionality on your calculator in place of an R command.)
- Some formulas include

$$\mathrm{SE}_{\bar{X}_1-\bar{X}_2} = \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

$$b_1 = r\frac{s_y}{s_x}, \quad b_0 = \bar{y} - b_1\bar{x}$$

For other specifics, see the

- Homework exercises assigned (including the "not-handed-in" ones)
- Posts (learning objectives) from Days 4.6-6.2