(possibly incomplete list of)

Topics Covered from Chapters 5 to 8

Chapter 5: Continuous Random Variables

Continuous Probability Distribution
Normal Distribution
Standard Normal
Changing a Normal to a Standard Normal you need to remember $z = (x - \mu)/\sigma$

Know that probability is area for continuous random variables. Be able to use a normal table to calculate probabilities for a Normal random variable.

How can we tell if the data comes from an approximately normal population?

<u>Not:</u> Section 5.6 - The Exponential Distribution

Chapter 6 and Supplement: Sampling Distributions and Central Limit Theorem

A sampling distribution is the probability distribution for a sample statistic (like ex. 6.1 on pg. 264)

A statistic is an <u>unbiased</u> estimate for a parameter if the expected value of the statistic is equal to the parameter. For example $E(\bar{x}) = \mu$ so $\bar{x}$ is an unbiased estimator for μ.

The Central Limit Theorem (in particular the boxes on pages 266 and 267).

n is generally large enough for the Central Limit Theorem if:
i) always true if the original population is normal
ii) generally ok if $n > 30$ if the population is continuous
iii) $np \geq 5$ and $n(1-p) \geq 5$ for a binomial experiment

Using a normal distribution to approximate a binomial random variable (including the continuity correction) [from Section 5.5]

χ^2 is always positive and is skewed to the right.
$(n-1)s^2/\sigma^2$ is χ^2 with (n-1) degrees of freedom for a random sample from a population that is normal with variance σ^2
How to use the χ^2 table

$\dfrac{\bar{x} - \mu}{s / \sqrt{n}}$ is *t* with (n-1) degrees of freedom for a random sample from a population that normal with mean μ

The *t* distribution is symmetric and has mean zero like the standard normal
When the degrees of freedom is large, the *t* is almost identical to the standard normal
When the degrees of freedom is small, the *t* distribution has thicker tails than the normal
How to use the *t* table

<u>Not:</u> The *F* distribution from the Supplement to Chapter 6

Chapter 7 and Supplement: Confidence Intervals

$(1-\alpha)100\%$ confidence interval
How changing the sample size changes a confidence interval in general
How changing the α changes a confidence interval in general
How to get the formula for telling you what sample size you need for a certain length CI
How to make confidence intervals for means
How to make confidence intervals for percentages using the Agresti and Coull correction
How to make confidence intervals for the variance
Checking assumptions

Not: Confidence interval with F-distribution from the Supplement to Chapter 7

Chapter 8: Tests of Hypothesis

null hypothesis = H_O
alternate hypothesis = H_A
Type I error
Type II error
significance level
α-level
rejection region
p-value: The probability of observing a test statistic as at least as extreme as the one observed if H_0 is true.
Telling if you reject H_0 from the p-value and α
Figuring out what the null and alternate hypotheses are from the statement of the problem
Checking assumptions

Testing about μ when the population is normal
that the *t*-test for one mean is fairly robust

Testing about *p* when n is large

Testing about σ^2 when the population is normal
that the χ^2 test for one variance isn't very robust

Not: Section 8.6 - Power