I. **Sections to Read** (All content from DeGroot and Schervish's *Probability and Statistics* unless otherwise noted) A digital copy of the textbook is available for on our class PWeb site, under the Day One Access tab.

(a) Sections 8.1

II. **Objectives** (By the end of the day's class, students should be able to do the following:)

- Give the definition of the sampling distribution of a statistic, and find the sampling distribution for common statistics.
- Compute probabilities based on the sampling distribution of a statistic.
- Explain how to use properties of the sampling distribution of an estimator quantify how close an estimator is to the value of the parameter.

III. **Reflection Questions** (Submit answers on Gradescope `https://www.gradescope.com`)

1) What is the difference between a **statistic** (defined in Definition 7.1.4) and an **estimator** (defined in Definition 7.4.1)?
2) Example 8.1.2 shows that if $X_1, \ldots, X_n$ form a random sample from a Normal distribution with mean μ and variance σ^2, then the sampling distribution of the sample mean $\bar{X}_n$ is Normally distributed with mean μ and variance σ^2/n. Suppose $n = 100$ and $\sigma^2 = 1$. Explain how to use this information, along with the 68-95-99.7 rule, to calculate the probability that the sample mean is within a distance of 0.2 from the true population mean μ.
3) True or False? The sampling distribution for every statistic is approximately Normal.

IV. **Additional Feedback** Are there any topics you would like further clarification about? Do you have any additional questions based on the readings / videos? *If not, you may leave this section blank.*