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) Section 8.6

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

- State and derive the formulas for the conjugate family of priors for the mean and precision of a Normal distribution.
- Prove that the marginal distribution of the mean is Normal, and that the marginal distribution of the precision is Gamma.
- Use the Bayesian framework to construct intervals that contain a parameter with a desired probability.

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

1) Assume that $\mathbf{X}$ is a sample from a Normal distribution with unknown mean $\mu$ and unknown precision $\tau$. True or false? The joint density function for a conjugate prior distribution for $(\mu, \tau)$ can be expressed as the product $f_1(\mu) f_2(\tau)$, where $f_1$ is the density function for a Normal distribution and $f_2$ is the density function for a Gamma distribution.

2) Explain one difference in interpretation between the frequentist's **confidence interval** and the Bayesian's intervals discussed in this section (often called **credible intervals**).

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.*