I. **Pre-class material** Either read the indicated textbook sections OR watch the indicated video.

(a) **Sections to Read** (All content from Blitzstein and Hwang's *Introduction to Probability* unless otherwise noted). A digital copy of the textbook is available for free via the authors' website.

- Sections 5.4, 5.9

(b) **Videos to Watch** (All videos from Blitzstein's Math 110 YouTube channel, unless otherwise noted)

- Lecture 13: Normal Distribution (from 23:00 to end)
- Lecture 14: Location, Scale, and LOTUS (from beginning to 23:00)
- Read Section 5.9 (there is no discussion of R in the video)

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

- Give the PDF, CDF and a story description for a Normal distribution.
- Show that the PDF for a standard Normal random variable is valid, and compute the mean and variance for the standard Normal.
- Express the CDF and PDF for a general Normal random variable in terms of the CDF and PDF for the standard Normal random variable.
- Use the $68-95-99.7$ rule to approximate probabilities of Normally distributed random variables.

III. **Reflection Questions** (Submit answers on Gradescope `https://www.gradescope.com/courses/425901`)

1) True or False: The function $\varphi(t) = \frac{1}{\sqrt{2\pi}}e^{-t^2/2}$ does not have an antiderivative.

2) Suppose $Z \sim N(0,1)$ and $X \sim N(2,25)$. *Recall that $X \sim N(a,b)$ means that X has mean a and* ***variance*** *b.*

   i. Use the 68-95-99.7 rule to estimate the value of $P(Z > 2)$ and $P(X > 12)$.

   ii. Use R to find accurate decimal approximations of $P(Z > 2)$ and $P(X > 12)$.

3) For $Z \sim N(\mu, \sigma^2)$, what is the **median** of Z (i.e. the value M so that $P(X < M) = \frac{1}{2}$)?

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.*