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.

- Read sections 4.1, 4.2, 4.5

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

- Lecture 9: Expectation, Indicator Random Variables, Linearity (from 14:00 to 41:00)
- Lecture 10: Expectation Continued (from beginning to 13:00)
- Read section 4.5 (there isn't a video covering LOTUS in the discrete case)

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

- State the definition of the expectation of a random variable
- Compute the expectation of the Bernoulli, Binomial, Hypergeometric, and Discrete Uniform random variables using the definition of expectation
- Show that expectation is a linear function of random variables using the definition of expectation
- Use linearity to compute the expectation of Binomial and Hypergeometric random variables
- Use the Law of the Unconscious Statistician (LOTUS) to compute express the expected value of one variable in terms of the pmf of another related variable.

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

1) Give an example of two random variables with different distributions that have the same expected value.
2) Suppose X is a random variable with expectation $E[X] = \mu$. What is the expectation of the random variable $X - \mu$?
3) True or false? If X is a random variable with $E[X] = \mu$, then $E[X^2] = \mu^2$.

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.*