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 3.1, 3.2, 3.3

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

- Lecture 7: Gambler's Ruin and Random Variables (from 33:00 to end)
- Lecture 8: Random Variables and Their Distributions (from beginning to 8:00)

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

- Give both the formal and informal definition of a random variable
- Define the probability mass function of a random variable
- Determine whether a given function can be the probability mass function for some random variable.
- Define the probability mass function of a random variable, and give explicit descriptions of this function for Bernoulli and Binomial random variables.
- Identify quantities which have the Bernoulli and Binomial distributions in a variety of probability models.

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

1) Based on your reading, what is one advantage for using random variables to describe the result of an experiment, rather than describing the result in terms of events (as we have done in the past)?

2) Two six-sided dice are thrown. Let $X$ denote their sum. Interpret the following equation in everyday language:

$$P(X = 7) = \frac{1}{6}.$$

(That is, write the equation as a sentence that could be understood by someone who isn't familiar with mathematical probability *notation*)

3) Suppose $X$ and $Y$ are both random variables with the Bernoulli-(0.5) distribution. Does this imply that $X = Y$? Explain.

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.*