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 3.7, 3.8, 3.9, 3.11

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

- Lecture 9: Expectation, Indicator Random Variables, Linearity (from 11:00 to 14:00)
- Lecture 8: Random Variables and Their Distributions (from 18:00 to 32:00)
- Read section 3.7, 3.11 (functions of variables and R are not discussed in the videos)

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

- Give formulas for the pdfs and cdfs of functions of random variables.
- Define and give examples of independent random variables; determine whether a collection of random variables are independent.
- Use independence of random variables to simplify probability calculations in a variety of problems.
- Simulate Bernoulli, Binomial, Hypergeometric and Uniform variables in R

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

1) True or False? If the PMF for a discrete random variable X is $p_X(x)$, then the PMF for the random variable $Z = 1 + X$ is $p_Z(x) = 1 + p_X(x)$.
2) Explain the difference between saying that X and Y are identically distributed, and saying that X and Y are independent. Is it possible for X and Y to be identically distributed, but not independent?
3) Use R to simulate 1000 independent Binomial random variables with $p = 0.5$ and $n = 10$. Based on your sample, approximate $P(X = 5)$. Then compare to the exact probability given by `dbinom`.

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.*