## Pre-class preparation

Please read the following textbook sections from Blitzstein and Hwang's *Introduction to Probability* (second edition) OR watched the indicated video from Blitzstein's Math 110 YouTube channel:

- Textbook: Sections 1.2-1.4

- Video: Lecture 1: Probability and counting, starting from minute 14:00

## Objectives

By the end of the day's class, students should be able to do the following:

- Define the sample space of an experiment.

- State the 'naive' definition of probability.

- Apply the multiplication rule to the counting problems of enumerating possibilities, sampling with replacement, and sampling without replacement.

- Compute the probabilities of outcomes using the multiplication rule, symmetries, and the inclusion-exclusion principle.

- Define and use the binomial coefficient to calculate probabilities of outcomes.

## Reflection Questions

Please submit your answers to the following questions to the corresponding Canvas assignment by 7:45AM:

1. Using your own words, describe the difference between **an event** and **an outcome**.

2. Three fair coins are tossed and the Heads or Tails result of each coin is recorded. If the outcome of interest is the sequence (i.e. order) of the results, what is the sample space of this experiment? What is the sample space if the outcome is total number of Heads?

3. Three fair coins are tossed and the sequence of Heads or Tails is recorded. What is the probability that at least one Heads is obtained?

4. Suppose we have a standard 52-card deck that has been shuffled well. We have four players, and the deck is dealt such that each player receives 13 cards. What is the probability that each player receives one Ace?

5. (Optional) Is there anything from the pre-class preparation that you have questions about? What topics would you like would you like some more clarification on?