- 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 Appendix A.1 (a refresher on sets) and 1.6
 - (b) Videos to Watch (All videos from Blitzstein's Math 110 YouTube channel, unless otherwise noted)
 - Lecture 2: Story Proofs, Axioms of Probability (Just from 39:00 onward)
 - Lecture 3: Birthday Problem, Properties of Probability
- II. **Objectives** (By the end of the day's class, students should be able to do the following:)
 - Perform and interpret operations (unions, intersections, complements) on sets.
 - State the general axiomatic definition of a probability space and interpret in everyday language
 - Enumerate and apply set-theoretic properties of probability.
 - Distinguish between "naive" and axiomatic probability.
- III. Reflection Questions (Submit answers on Gradescope https://www.gradescope.com/courses/425901)
 - 1) Using theorems or definitions from these sections, or by appealing to a picture, explain why for any events A and B, $P(A \cup B) \leq P(A) + P(B)$. Under what circumstances are the left and right expressions actually equal?
 - 2) What are some advantages of the axiomatic probability system described in section 1.6 compared to the 'naive' theory described in section 1.3?
 - 3) Suppose the probability space for an experiment consists of four outcomes $\{a, b, c, d\}$.
 - i. Give an example of two mutually exclusive events for this experiment.
 - ii. Suppose the probability model for this experiment has

$$P(\{a\}) = \frac{1}{2} \quad P(\{b\}) = \frac{1}{4} \quad P(\{c\}) = \frac{1}{8} \quad P(\{d\}) = \frac{1}{8}$$

What is the probability that neither a nor b occurs?

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.