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 2.3, 2.4, 2.6

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

- Lecture 4: Conditional Probability (from 45:00 through end)
- Lecture 5: Conditioning Continued, Law of Total Probability (from start through 32:00)

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

- Use Bayes' Law and the Law of Total Probability in order to compute probabilities in a wide variety of problems.
- Explain what is meant by the statement "conditional probabilities are probabilities" and what is meant by the statement "Bayes' Rule is coherent"

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

1) Let S be a sample space, and let A, B, C be events. Simplify the following ratio:

$$\frac{P(A)P(B|A)P(C|A,B)}{P(C)P(B|C)P(A|B,C)}$$

2) Describe one reason why we may use Bayes' Theorem to calculate a conditional probability.

3) Briefly explain what is meant by the statement *Bayes' Rule is coherent.* Why is it important that Bayes' rule is coherent?

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.*