

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 2.7 (just part 2.7.1), 2.8
- (b) **Videos to Watch** (All videos from Blitzstein's Math 110 YouTube channel, unless otherwise noted)
- Lecture 5: Conditioning Continued, Law of Total Probability (from 32:00 to end)
 - Lecture 6: Monty Hall, Simpson's Paradox

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

- Describe the Monty Hall problem and explain what is counter-intuitive about the correct solution.
- Identify and give examples of the *prosecutor's fallacy*, the *defense attorney's fallacy* and *Simpson's paradox*.
- Use the formal language of sets and the axioms of probability to explain the misconceptions involved in the *prosecutor's fallacy*, the *defense attorney's fallacy* and *Simpson's paradox*.

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

- 1) Provide an example of the *prosecutor's fallacy*, the *defense attorney's fallacy* or *Simpson's paradox* that you have encountered in your own life. Alternatively, make up a hypothetical real world situation exemplifying one of these misconceptions.
- 2) Why is it important that we make explicit in the Monty Hall problem the way Monty chooses which door to open? Consider the extreme case where Monty Hall always opens door 2 unless doing so would reveal a car.

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.*