

**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.

- Sections 6.1 - 6.3

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

- There aren't any lecture videos covering moments. Instead, read Sections 6.1 - 6.3

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

- Identify the relative locations of the mean, median, and mode of a random variable based on a graph of the PDF/PMF.
- Describe circumstances where each of the mean, median, and mode is the most appropriate measure of central tendency of a variable.
- Compare the relative skew and spread of a variable based both on a description and the graph of its PDF/PMF.
- State the definition of the  $n$ th moment, the  $n$ th central moment, and the  $n$ th standardized moment of a random variable.
- Give examples of symmetric and asymmetric random variables.
- Explain what variance, skew, and kurtosis measure.

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

- 1) In two sentences or less, summarize what the *skew* and the *kurtosis* of a random variable tell you about the shape of its distribution.
- 2) Are there any random variables with the property that every **even** central moment is 0? If so, give an example. If not, explain why not.
- 3) Based on Figure 6.4 in section 6.1, which distribution to you suspect has higher kurtosis, the standard Normal random variable or the scaled  $t_3$  distribution?

**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.*