

A COURSE IN BIOSTATISTICAL LITERACY: LEARNING TO EVALUATE EVIDENCE

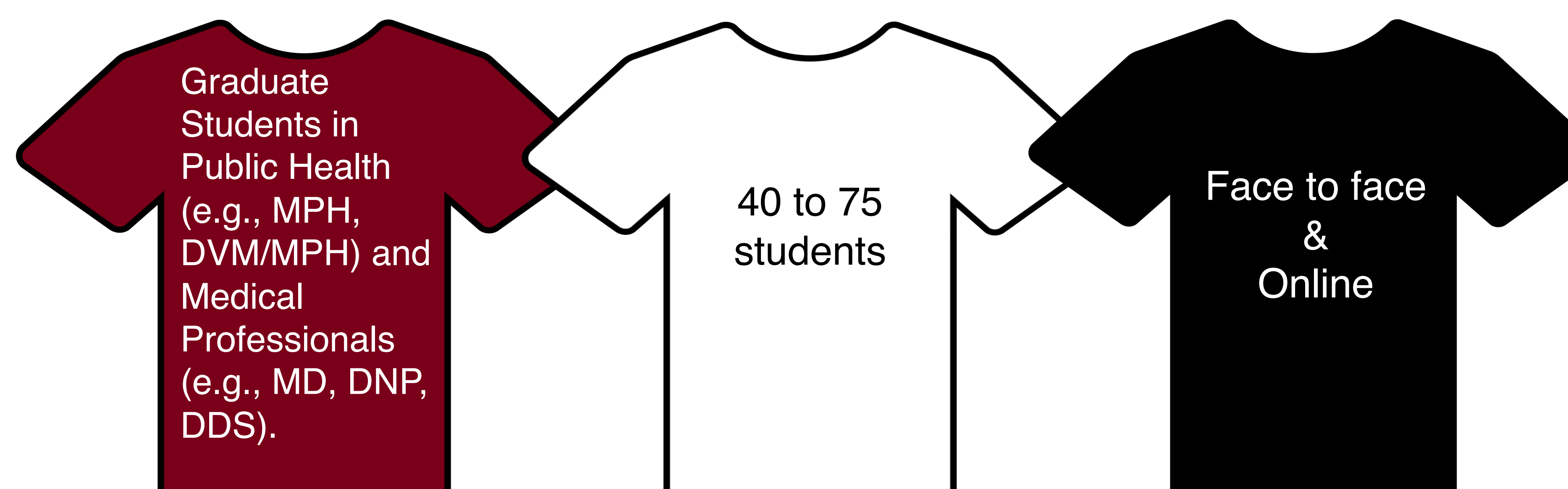
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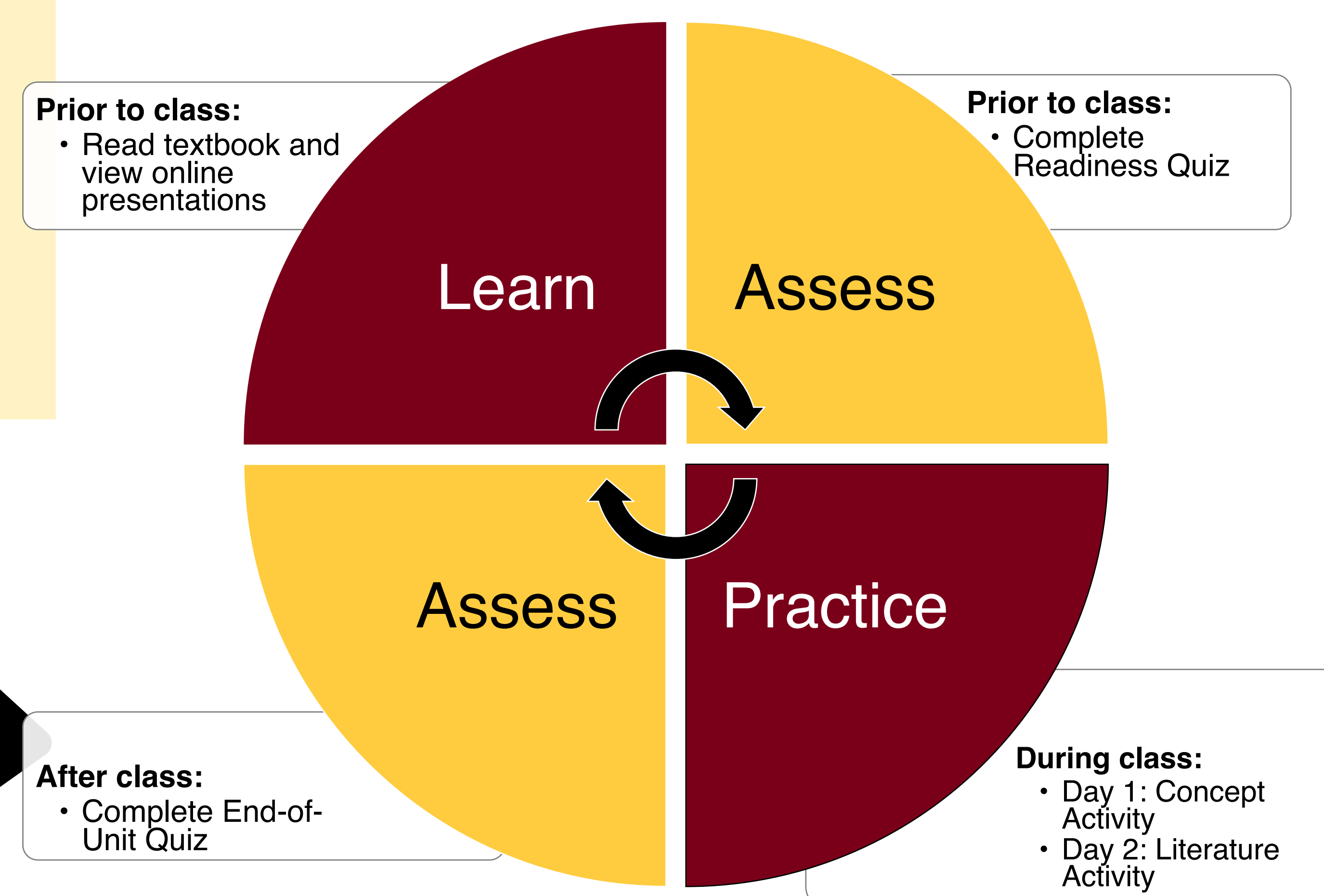
INTRODUCTION

- Introductory (bio)statistics courses typically teach statistical concepts and methods in tandem with data analysis using statistical software, **but...**
- This approach is not always relevant to graduate students in public health and medicine, who need to evaluate evidence but not analyze data.
- **Solution:** *Biostatistical Literacy* course:
 - Involves minimal calculations and no statistical software.
 - Develops students' abilities to **read, interpret, and evaluate statistical results** in the medical and public health literature.

SETTING



UNIT TIMELINE (1 WEEK)



CONCEPT ACTIVITY

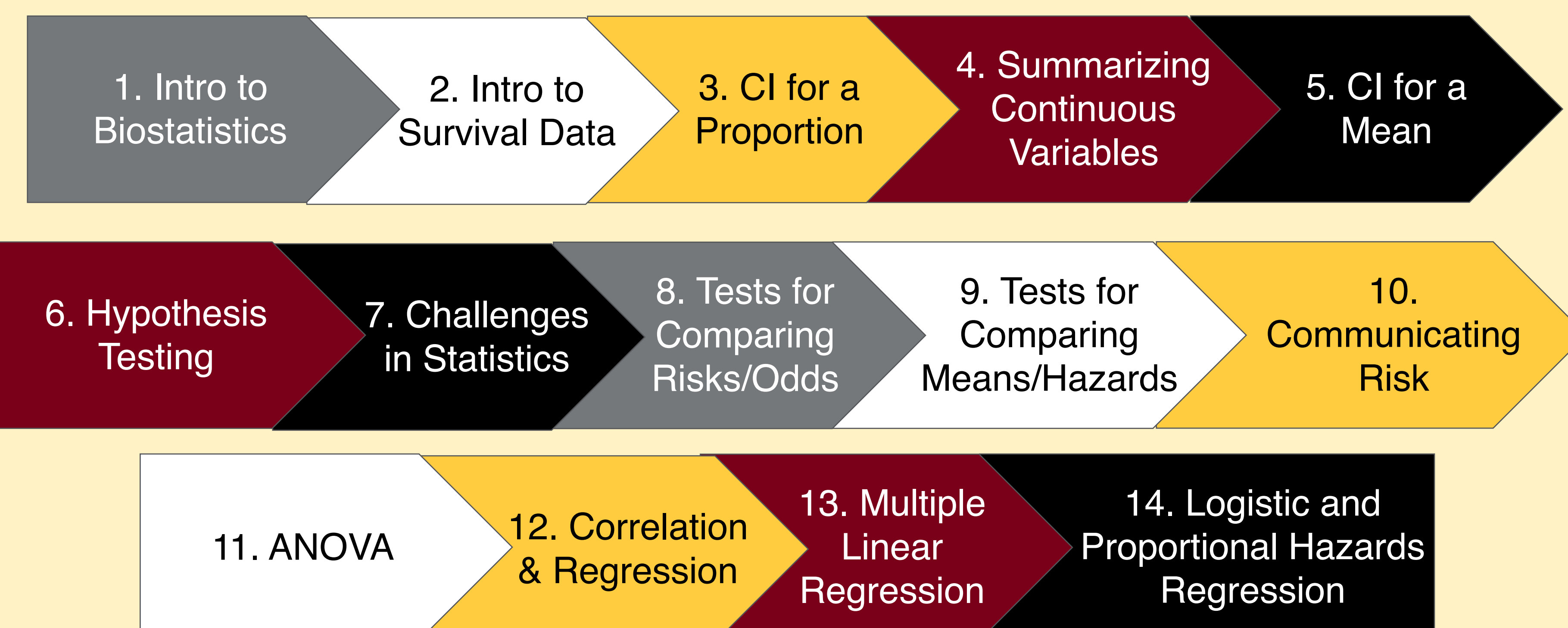
- Students **explore** and **solidify** their understanding of the unit **concepts**.
- Question examples:
 - SURVIVAL DATA** Describe how many participants were censored.
 - HYPOTHESIS TESTING** Provide a description of how the p -value is found and how to interpret the p -value.
 - COMPARING RISKS/ODDS** What conclusion can you draw from this confidence interval of the relative risk about the effectiveness of the treatment compared to the control? Explain your reasoning.
 - REGRESSION** According to the output from MLR, interpret the "slope" value for x_1 (binary predictor) in the MLR model.

LITERATURE ACTIVITY

- Students **apply their knowledge** of the unit concepts to an **article** from the medical or health sciences literature.
- Question examples:
 - INTRODUCTION** What was the authors' primary scientific question and finding? What sampling method and study design were used?
 - METHODS** What statistical methods were used?
 - RESULTS** What was the primary outcome of interest? Interpret the results of the study (e.g., what does "this" value from Table 1 mean?). What conclusions can the authors make based on the inferential results?
 - DISCUSSION** What were the strengths and limitations of the study? Overall, is the authors' evidence to support their primary claim convincing?

COURSE DESCRIPTION

- Textbook: Motulsky, H. (2018). *Intuitive biostatistics: A nonmathematical guide to statistical thinking* (4th ed.).
- 14 Units (i.e., statistical topics):



STUDENT FEEDBACK

POSITIVE INSIGHTS

- "I thought that the concept/literature activities were very helpful in **facilitating deeper thought** in biostatistics as well as **how to apply the concepts**."
- "I appreciated the **focus on biostatistical literacy** as opposed to statistical mathematics for a student, like myself, who does not plan to conduct my own research. PUBH 6414 has definitely **given me the tools to understand statistical methods** when reading and interpreting research."

NEGATIVE INSIGHTS

- "Very **time consuming** course w/ minimal flexibility in schedule."
- "The course was very organized, but it **did not match my learning style**. I prefer traditional classroom based learning."
- "It was also hard to stay motivated in that class as **it was largely repetitive**, it would have been nice to apply what we were learning to a different type of activity on some weeks rather than reading an article or publication every class period."

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