

# 105 Teaching Notes

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## 1 Before Teaching

- If allowing test corrections, probably only give back 1/3 of possible points.
- Revise the lecture guides
  - Clarify the “how many hands have 3 spades” to “how many hands have exactly 3 spades”
- Revise the syllabus to include tips for success
  - Learn the vocab
  - Approach the subject deductively, rather than inductively
    - \* Rather than trying to do a problem by going back and looking at similar examples, then doing similar things, think about the general principle being applied and apply the general principle to the new problem.
- Put extra space into the on-your-own section of the lecture guides
- Office Hours on Monday, Tuesday, and Thursday for summer session

## 2 While Teaching

- Check/revise rubrics
- Review proper notation
  - Talk about the difference between sets, ordered tuples, and numbers
- Reinforce the distinction between the size of a set and the elements it contains.
  - Can use questions like  $n(X) \in X$
- Be clear about notational expectations
  - If a student uses a new set name, they have to define it properly
  - Otherwise, students can write a brief description of what they’re counting.
- Recommended problems for 1.5 and 2.4 have solutions in the homework solutions folder
- Be prepared to explain why rolling a pair of dice gives an ordered pair:
  - Coloring dice doesn’t change probabilities, but it does affect how we think about it
  - Use a  $6 \times 6$  grid, one axis is one die, the other axis is the other die, and the corresponding spot in the matrix is the sum.
- Rewrite all solutions, both because of old mistakes and because of updates to lecture guides and that sort of thing

- If you decide to be picky about sets, make sure to assign problems in which sets are easy to define
- Only assign 3.4.5a–c on HW 5
- Do more challenging problems in the counting section: e.g. rolling dice, counting number of full houses, hands with “3 hearts and no clubs,” etc.
- Don’t forget midterm feedback
- Add an in-class probability example where order matters
- Emphasize what a counterexample means when doing logic. An argument isn’t invalid when  $p$  and  $q$  are true and  $r$  is false, it’s either always valid or always invalid.
- Have the students construct examples!!!!
- Emphasize the importance of understanding probability in order to productively engage with social statistics: e.g. the question “are police targeting blacks?” is a question of conditional probability. “Given that a person is black, what is the probability that they are targeted by police? How does this compare to similar conditional probabilities for white people?”