STOR 155 Introductory Statistics

Lecture 11: General Probability Rules

Review

- Outcome, Sample space, Event
- Union (or), Intersection (and), Complement, Disjoint, …
- Venn diagram

- **Basic rules:**
  - For any event A, $P(\text{ not } A) = 1 - P(A)$.
  - If A and B are disjoint, then $P(A \cap B) = 0$.
  - For any two events A and B,

$$P(A \cup B) = P(A) + P(B) - P(A \cap B).$$

General Addition Rule

ADDITION RULE FOR DISJOINT EVENTS

If events A, B, and C are disjoint in the sense that no two have any outcomes in common, then

$$P(\text{one or more of } A, B, C) = P(A) + P(B) + P(C)$$

This rule extends to any number of disjoint events.

Definition, pg 313
Introduction to the Practice of Statistics, Fifth Edition