When students have completed CS70, Discrete Mathematics and Probability Theory, we expect them to:

1. Be able to understand what a valid mathematical proof is.

2. Be able to generate a valid proof for a simple statement.

3. Be fluent with the use of induction, and its variants, in proofs.

4. Understand the basics of modular arithmetic and polynomial interpolation.

5. Be familiar with the basic vocabulary and basic concepts of graph theory.

6. Know how to count simple combinatorial configurations.

7. Understand the basic concepts of discrete probability: sample spaces, random variables, and their relationship; distributions, expectation, and variance.

8. Be familiar with simple situations in which probability helps us understand computation quantitatively.

9. Appreciate that there are pitfalls in the use of probability and statistics.

10. Understand how the sample size affects the quality of statistical inference, e.g. in polling.

11. Understand the basic laws of large numbers and extremal probability bounds, and how discrete processes give rise, in the limit, to important continuous distributions.

12. Understand that there are limits to computation.

13. Convey a sense of elegance, excitement and relevance of mathematics.