

Sections Covered

Test 1 covers chapters 1 and 2. The only topic you are not responsible for is the Empirical Rule (page 126).

Important Topics and Terms

1. Data Basics: observational unit, variable, sample, population, categorical variable, quantitative variable, explanatory variable, response variable
2. Numerical Summaries of Data: proportion, conditional proportion, two-way table, odds, relative risk, odds ratio, median, mean, five number summary, IQR, range, standard deviation, resistant measures
3. Graphical Summaries of Data: segmented bar graph, dotplot, histogram, boxplot, skewed distributions, outlier, outlier rule
4. Study Design: observational studies, randomized comparative experiments, randomization, control, treatment, placebo, blocking, blinding, double-blind, case-control study, cohort study, cross-classification study, prospective study, retrospective study, confounding variable
5. Random Variables and Probability: outcome, event, sample space, probability distribution, cumulative probability, three probability rules (sum rule, complement rule, total probability rule) equally likely, mutually exclusive, expected value, hypergeometric distribution, binomial coefficients ($\binom{n}{k}$)
6. Statistical Significance: p-value, empirical p-value, Fisher's Exact Test, test of significance
7. Miscellaneous terms: independent, association, Simpson's paradox, standard score (z-score), principle of least squares

Technology

Since we do not have quite enough computers for everyone to have their own, you will not be using a computer for this exam. You may, however, be given output from R that you need to interpret. You may use a calculator for the exam, but be sure to record on your test paper what you had your calculator do. **No mystery numbers allowed.**

Short Answer Responses

Some of the items on the test will require "short answers". Short answers should typically be between a couple sentences and a paragraph in length. When grading short answers, I am looking for things like completeness, clarity, accuracy, conciseness, focus, and importance in addition to correctness. In short, I am looking for high quality answers. So be thoughtful as you answer these questions. If asked for examples, pick particularly clear ones; if asked for reasons, pick important ones; etc.