

Chapters 1–4, 6–12 Concepts

Chapter 1

1.1 — Introduction

- Statistical process: identify, collect, organize, draw conclusions
- Qualitative vs. Quantitative
- Discrete vs. Continuous

1.2 — Study vs. Experiment

- Simple Random Sampling

1.3 — Other Sampling Methods

- Stratified Sample
- Systematic Sample
- Cluster Sample

1.5 — Experimental Design

- Completely Randomized
- Matched Pairs
- Randomized Block

Chapter 2

2.1 — Organizing Qualitative Data

- (Relative) Frequency Distribution
- Bar Graphs
- Pie Charts

2.2 — Organizing Quantitative Data

- (Relative) Frequency Distribution
- Histograms
- Stem and Leaf Plots

Chapter 3

3.1 — Measures of Central tendency

- Mean
- Median
- Mode

3.2 — Measures of Dispersion

- Range
- Variance

- Standard Deviation
- Empirical Rule

3.3 — Grouped Data

- Mean
- Weighted Mean
- Variance/Standard Deviation

3.4 — Measures of Position

- z-scores
- Percentiles
- Quartiles
- Outliers

3.5 — Five number summary / boxplot

Chapter 4

4.1 — Linear Relationships

- Scatter Plots
- Correlation

4.2 — Linear Regression

4.3 — Interpreting Linear Regression

- Coefficient of Determination
- Residual Analysis
- Influential Observations

Chapter 6

6.1 — Discrete Random Variables

- Definition
- Properties
- Expected Value

6.2 — Binomial Distribution

- Binomial Experiments
- Probabilities
- Mean, Standard Deviation

Chapter 7

7.1 — Normal Distribution

- Probability as area
- Properties

- Standard Normal

7.2, 7.3 — Areas under normal curves

7.4 — Assessing Normality

- Normal Probability Plots

7.5 — Normal Approximation to the Binomial

- Mean, standard deviation
- Continuity Correction ($\pm 1/2$)

Chapter 8

8.1 — Sampling Distribution of the Mean

- For normal populations
- For large n (Central Limit Theorem)

8.2 — Sampling Distribution of the Sample Proportion

- Mean, standard deviation
- Conditions

Chapter 9

9.1 — Confidence Intervals for the mean

- Z-intervals (know σ)

9.2 — Confidence Intervals for the mean

- t -intervals (don't know σ)

9.3 — Confidence Intervals for p

- Z-intervals

Confidence Intervals for the Standard Deviation

- The χ^2 distribution
- χ^2 confidence intervals

Chapter 10

10.1 — Hypothesis Testing

- null/alternative hypotheses
- Type I/II Error
- Left-tailed, right-tailed, two-tailed alternatives

10.2 — Hypothesis Testing for the mean

- Z-test (σ known)

10.3 — Hypothesis Testing for the mean

- t-Test (σ unknown)

10.4 — Hypothesis Testing for p

- Z-test for population proportion

10.5 — Hypothesis Testing for the Standard Deviation.

- The χ^2 test

Chapter 11

11.1 — Inference about two means

- Dependent Samples (t -test for differences)
- Confidence Intervals

11.2 — Inference about two means

- Independent Samples (t -test for $\mu_1 - \mu_2$.)
- Confidence Intervals

11.3 — Inference about two proportions

- t -test
- Confidence Intervals

Chapter 12

12.1 — Goodness of Fit Test