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
Chapter 7

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 $\sigma$)
9.2 — Confidence Intervals for the mean
• $t$-intervals (don’t know $\sigma$)
9.3 — Confidence Intervals for $p$
• Z-intervals
Confidence Intervals for the Standard Deviation
• The $\chi^2$ distribution
• $\chi^2$ 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 ($\sigma$ 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 $\chi^2$ 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