

**Correlation Guide for Users of Walpole et al.,
Probability and Statistics for Engineers and Scientists, 7/e**

corresponding to

**McGraw-Hill's Statistics for Engineers and Scientists
by William Navidi**

| Chapter No./Title | |
|--|-----------------------------|
| Walpole Sec. No./Title | Navidi Sec. No. |
| 1 Introduction to Statistics and Data Analysis | |
| 1.1 Overview: Statistical Inference, Samples, Populations, and Experimental Design | Introduction for Ch. 1, 1.1 |
| 1.2 The Role of Probability | 2.1 |
| 1.3 Sampling Procedures; Collection of Data | 1.1 |
| 1.4 Measures of Location: The Sample Mean | 1.2 |
| 1.5 Measures of Variability | 1.2 |
| 1.6 Discrete and Continuous Data | 1.2 |
| 1.7 Statistical Modeling, Scientific Inspection, and Graphical Diagnostics | 1.1 |
| 1.8 Graphical Methods and Data Description | 1.2, 1.3 |
| 2 Probability | |
| 2.1 Sample Space | 2.1 |
| 2.2 Events | 2.1, 2.3 |
| 2.3 Counting Sample Points | 2.2 |
| 2.4 Probability of an Event | 2.1 |
| 2.5 Additive Rules | 2.1 |
| 2.6 Conditional Probability | 2.3 |
| 2.7 Multiplicative Rules | 2.3 |
| 2.8 Bayes' Rule | 2.3 |
| 3 Random Variables and Probability Distributions | |
| 3.1 Concept of a Random Variable | 2.4 |
| 3.2 Discrete Probability Distributions | 2.4 |
| 3.3 Continuous Probability Distributions | 2.4 |
| 3.4 Joint Probability Distributions | 2.6 |

| Chapter No./Title Walpole Sec. No./Title | Navidi Sec. No. |
|--|------------------------|
| 4 <i>Mathematical Expectation</i> | |
| 4.1 Mean of a Random Variable | 2.4 |
| 4.2 Variance and Covariance | 2.4, 2.6 |
| 4.3 Means and Variances of Linear Combinations of Random Variables | 2.5, 2.6 |
| 4.4 Chebyshev's Theorem | --- |
| | |
| 5 <i>Some Discrete Probability Distributions</i> | |
| 5.1 Introduction | 2.3 |
| 5.2 Discrete Uniform Distribution | --- |
| 5.3 Binomial and Multinomial Distributions | 4.2, 4.4 |
| 5.4 Hypergeometric Distribution | 4.4 |
| 5.5 Negative Binomial and Geometric Distributions | 4.4 |
| 5.6 Poisson Distribution and the Poisson Process | 4.3 |
| | |
| 6 <i>Some Continuous Probability Distributions</i> | |
| 6.1 Continuous Uniform Distribution | --- |
| 6.2 Normal Distribution | 4.5 |
| 6.3 Areas Under the Normal Curve | 4.5 |
| 6.4 Applications of the Normal Distribution | 4.5 |
| 6.5 Normal Approximation to the Binomial | 4.10 |
| 6.6 Gamma and Exponential Distributions | 4.7, 4.8 |
| 6.7 Applications of the Exponential and Gamma Distributions | 4.7, 4.8 |
| 6.8 Chi-Squared Distribution | 6.10 |
| 6.9 Lognormal Distribution | 4.6 |
| 6.10 Weibull Distribution | 4.8 |
| | |
| 7 <i>Functions of Random Variables (Optional)</i> | |
| 7.1 Introduction | --- |
| 7.2 Transformations of Variables | 7.4 |
| 7.3 Moments and Moment-Generating Functions | --- |
| | |
| 8 <i>Fundamental Sampling Distributions and Data Descriptions</i> | |
| 8.1 Random Sampling | 1.1 |
| 8.2 Some Important Statistics | 1.1, 1.2 |
| 8.3 Data Displays and Graphical Methods | 1.3, 4.9 |
| 8.4 Sampling Distributions | 4.10 |
| 8.5 Sampling Distribution of Means | 4.10 |
| 8.6 Sampling Distribution of S^2 | --- |
| 8.7 t -Distribution | 5.3 |
| 8.8 F -Distribution | 6.11 |
| | |

| Chapter No./Title | |
|---|-----------------------------|
| Walpole Sec. No./Title | Navidi Sec. No. |
| 9 One- and Two-Sample Estimation Problems | |
| 9.1 Introduction | Introduction to Ch. 5 and 6 |
| 9.2 Statistical Inference | Introduction to Ch. 5 and 6 |
| 9.3 Classical Methods of Estimation | 3.1, 5.1 |
| 9.4 Single Sample: Estimating the Mean | 5.1 |
| 9.5 Standard Error of a Point Estimate | 2.5, 3.1 |
| 9.6 Prediction Interval | 7.3 |
| 9.7 Tolerance Limits | --- |
| 9.8 Two Samples: Estimating the Difference Between Two Means | 5.4, 5.6 |
| 9.9 Paired Observations | 5.7 |
| 9.10 Single Sample: Estimating a Proportion | 5.2 |
| 9.11 Two Samples: Estimating the Difference Between Two Proportions | 5.5 |
| 9.12 Single Sample: Estimating the Variance | --- |
| 9.13 Two Samples: Estimating the Ratio of Two Variances | --- |
| 9.14 Bayesian Methods of Estimation (Optional) | --- |
| 9.15 Maximum Likelihood Estimation (Optional) | --- |
| | |
| 10 One- and Two-Sample Tests of Hypotheses | |
| 10.1 Statistical Hypotheses: General Concepts | 6.1 |
| 10.2 Testing a Statistical Hypothesis | 6.1 |
| 10.3 One- and Two-Tailed Tests | 6.1 |
| 10.4 The Use of P -Values for Decision Making | 6.2 |
| 10.5 Single Sample: Tests Concerning a Single Mean (Variance Known) | 6.1 |
| 10.6 Relationship to Confidence Interval Estimation | 6.2 |
| 10.7 Single Sample: Tests on a Single Mean (Variance Unknown) | 6.4 |
| 10.8 Two Samples: Tests on Two Means | 6.5 |
| 10.9 Choice of Sample Size for Testing Means | 6.1 |
| 10.10 Graphical Methods for Comparing Means | 1.3 |
| 10.11 One Sample: Test on a Single Proportion | 6.3 |
| 10.12 Two Samples: Tests on Two Proportions | 6.6 |
| 10.13 One- and Two-Sample Tests Concerning Variances | 6.11 |
| 10.14 Goodness-of-Fit Test | 7.2 |
| 10.15 Test for Independence (Categorical Data) | 6.10 |
| 10.16 Test for Homogeneity | 6.10 |
| 10.17 Testing for Several Proportions | 6.10 |
| 10.18 Two-Sample Case Study | --- |

| Chapter No./Title Walpole Sec. No./Title | Navidi Sec. No. |
|---|-----------------------------|
| <i>11 Simple Linear Regression and Correlation</i> | |
| 11.1 Introduction to Linear Regression | Introduction for Ch. 7, 7.2 |
| 11.2 Simple Linear Regression | 7.2 |
| 11.3 Least Squares and the Fitted Model | 7.2 |
| 11.4 Properties of the Least Squares Estimators | 7.2, 7.3 |
| 11.5 Inferences Concerning the Regression Coefficients | 7.3 |
| 11.6 Prediction | 7.3 |
| 11.7 Choice of a Regression Model | 8.3 |
| 11.8 Analysis-of-Variance Approach | 9.1 |
| 11.9 Test for Linearity of Regression: Data with Repeated Observations | --- |
| 11.10 Data Plots and Transformations | 7.4 |
| 11.11 Simple Linear Regression Case Study | --- |
| 11.12 Correlation | 7.1 |
| | |
| <i>12 Multiple Linear Regression and Certain Nonlinear Regression Models</i> | |
| 12.1 Introduction | Introduction for Ch. 8, 8.1 |
| 12.2 Estimating the Coefficients | 8.1 |
| 12.3 Linear Regression Model Using Matrices (Optional) | --- |
| 12.4 Properties of the Least Squares Estimators | 8.1 |
| 12.5 Inferences in Multiple Linear Regression | 8.1 |
| 12.6 Choice of a Fitted Model Through Hypothesis Testing | 8.3 |
| 12.7 Special Case of Orthogonality (Optional) | --- |
| 12.8 Categorical or Indicator Variables | --- |
| 12.9 Sequential Methods for Model Selection | 8.3 |
| 12.10 Study of Residuals and Violation of Assumptions | 8.1 |
| 12.11 Cross Validation, C_p , and Other Criteria for Model Selection | 8.3 |
| 12.12 Special Nonlinear Models for Nonideal Conditions | --- |

| Chapter No./Title Walpole Sec. No./Title | Navidi Sec. No. |
|--|------------------------|
| <i>13 One-Factor Experiments: General</i> | |
| 13.1 Analysis-of-Variance Technique | 9.1 |
| 13.2 The Strategy of Experimental Design | 9.1, 9.5 |
| 13.3 One-Way Analysis of Variance: Completely Randomized Design | 9.1 |
| 13.4 Tests for the Equality of Several Variances | --- |
| 13.5 Single-Degree-of-Freedom Comparisons | 9.1 |
| 13.6 Multiple Comparisons | 9.2 |
| 13.7 Comparing Treatments with a Control | --- |
| 13.8 Comparing a Set of Treatments in Blocks | 9.4 |
| 13.9 Randomized Complete Block Designs | 9.4 |
| 13.10 Graphical Methods and Further Diagnostics | 9.1 |
| 13.11 Latin Squares (Optional) | --- |
| 13.12 Random Effects Models | 9.1 |
| 13.13 Power of Analysis-of-Variance Tests | 9.1 |
| 13.14 Case Study | --- |
| | |
| <i>14 Factorial Experiments (Two or More Factors)</i> | |
| 14.1 Introduction | 9.3 |
| 14.2 Interaction and the Two-Factor Experiment | 9.3 |
| 14.3 Two-Factor Analysis of Variance | 9.3 |
| 14.4 Graphical Analysis in the Two-Factor Problem | 9.3 |
| 14.5 Three-Factor Experiments | 9.5 |
| 14.6 Model II and III Factorial Experiments | --- |
| 14.7 Choice of Sample Size | 9.1 |
| <i>15 2^k Factorial Experiments and Fractions</i> | |
| 15.1 Introduction | 9.5 |
| 15.2 Analysis of Variance and the Calculation of Effects | 9.5 |
| 15.3 Nonreplicated 2 ^k Factorial Experiment | 9.5 |
| 15.4 Injection Molding Case Study | --- |
| 15.5 Factorial Experiments in Incomplete Blocks | --- |
| 15.6 Partial Confounding | --- |
| 15.7 Factorial Experiments in a Regression Setting | 9.5 |
| 15.8 The Orthogonal Design | 9.5 |
| 15.9 Fractional Factorial Experiments | 9.5 |
| 15.10 Analysis of Fractional Factorial Experiments | 9.5 |
| 15.11 Higher Fractions and Screening Designs | --- |
| 15.12 Construction of Resolution III and IV Designs with 8, 16, and 32 Design Points | --- |
| 15.13 Other Two-Level Resolution III Designs; The Plackett-Burman Designs | --- |
| 15.14 Taguchi's Robust Parameter Design | --- |

| Chapter No./Title Walpole Sec. No./Title | Navidi Sec. No. |
|---|-------------------------|
| <i>16 Nonparametric Statistics</i> | |
| 16.1 Nonparametric Tests | 6.9 |
| 16.2 Sign Test | --- |
| 16.3 Signed-Rank Test | 6.9 |
| 16.4 Rank-Sum Test | 6.9 |
| 16.5 Kruskal-Wallis Test | --- |
| 16.6 Runs Test | --- |
| 16.7 Tolerance Limits | --- |
| 16.8 Rank Correlation Coefficient | --- |
| <i>17 Statistical Quality Control</i> | |
| 17.1 Introduction | Introduction for Ch. 10 |
| 17.2 Nature of the Control Limits | 10.1 |
| 17.3 Purposes of the Control Chart | 10.1 |
| 17.4 Control Charts for Variables | 10.2 |
| 17.5 Control Charts for Attributes | 10.3 |
| 17.6 Cusum Control Charts | 10.4 |