**Math 1342 – Statistics**

**Elementary Statistics, A Brief Version**

Allan Bluman

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**Catalog Description:**
3 Credits (3 hrs. lec.) Collection, analysis, presentation and interpretation of data, and probability. Analysis includes descriptive statistics, correlation and regression, confidence intervals and hypothesis testing. Use of appropriate technology is recommended. (2705015119) Prerequisite: [MATH 030](http://catalog.lonestar.edu/content.php?filter%5B27%5D=MATH&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=22&expand=&navoid=8470&search_database=Filter#tt4982)8 or [MATH 030](http://catalog.lonestar.edu/content.php?filter%5B27%5D=MATH&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=22&expand=&navoid=8470&search_database=Filter#tt405)9 or placement by testing. Co-requisite: MATH 0242

**Course Learning Outcomes:**
The student will:

* Explain the use of data collection and statistics as tools to reach reasonable conclusions.
* Recognize, examine and interpret the basic principles of describing and presenting data.
* Compute and interpret empirical and theoretical probabilities using the rules of probabilities and combinatorics.
* Explain the role of probability in statistics.
* Examine, analyze and compare various sampling distributions for both discrete and continuous random variables.
* Describe and compute confidence intervals.
* Solve linear regression and correlation problems.
* Perform hypothesis testing using statistical methods.
* Apply the Central Limit Theorem to the sampling process.

**Book Sections**

Chapter 1

Chapter 1 is mainly for reading and terminology.

1.1 Descriptive and Inferential Statistics

1.2 Variables and Type of Data

1.3 Data Collection and Sampling Techniques

1.4 Experimental Design

1.5 Computers and Calculators

Chapter 2

2.1 Organizing Data

2.2 Histograms, Frequency Polygons, and Ogives

2.3 Other Types of Graphs

2.4 Paired Data and Scatter Plots

Chapter 3

3.1 Measures of Central Tenancy

3.2 Measures of Variation

3.3 Measures of Position

3.4 Exploratory Data Analysis

Chapter 4

4.1 Sample Spaces and Probability

4.2 The Addition Rules for Probability

4.3 The Multiplication Rules and Conditional Probability

4.4 Counting Rules

4.5 Probability and Counting Rules

Chapter 5

5.1 Probability Distributions

5.2 Mean, Variance, Standard Deviation and Expectation

5.3 The Binomial Distribution

Chapter 6

6.1 Normal Distributions

6.2 Applications of the Normal Distribution

6.3 The Central Limit Theorem

Chapter 7

7.1 Confidence Intervals

7.2 Confidence Intervals for the Mean when Standard Deviation is Known

7.2 Confidence Intervals for the Mean when Standard Deviation is Unknown

7.3 Confidence Intervals and Sample Size for Proportions

7.4 Confidence Intervals for Variances and Standard Deviations

Chapter 8

8.1 Steps in Hypothesis Testing – Traditional Method

8.2 z Test for a Mean

8.3 t Test for a Mean

8.4 z Test for a Proportion

8.5 Chi-Squared Test for a Variance and Standard Deviation

Chapter 9

9.1 Testing the Difference Between Two Parameters

9.2 Testing the Difference Between Two Means, Using the z-test

9.3 Testing the Difference Between Two Means: Using the t test

Chapter 10\*

10.1 Correlation

10.2 Regression

\*It is optional to calculate r or the regression equation by hand. It is also optional to perform the hypothesis testing in this chapter.

Chapter 11 (Optional)

11.1 Test for Goodness of Fit

11.2 Tests Using Contingency Tables

11.3 Analysis of Variance (ANOVA)