

Class: STAT113 Fall2023 - TutorSite Class Code: J6VXV-JTKDR
 Subject: Introduction to Statistics Instructor: Clarkson
 Class Dates: 08/25/2023 - 12/27/2023 Class Content: 154 topics / 129 accessible topics
 Textbook: Navidi/Monk: Elementary Statistics, 4th Ed. (McGraw-Hill)

Modules	Dates
1. OBJ1 Collecting and Displaying Data (20 topics)	08/25/2023 12:01 AM - 09/06/2023 11:59 PM
2. OBJ2 Measures of Center, Spread and Position (22 topics)	09/07/2023 12:01 AM - 09/17/2023 11:59 PM
3. OBJ3 Correlation and Simple Linear Regression (11 topics)	09/20/2023 12:01 AM - 09/28/2023 11:59 PM
4. OBJ4 Probability and the Normal Distribution (38 topics)	09/29/2023 12:01 AM - 10/15/2023 11:59 PM
5. OBJ5 The CLT and Sampling Distribution (7 topics)	10/18/2023 12:01 AM - 10/25/2023 11:59 PM
6. OBJ6 Confidence Intervals (17 topics)	10/26/2023 12:01 AM - 11/06/2023 11:59 PM
7. OBJ7 Hypothesis Testing (19 topics)	11/07/2023 12:01 AM - 11/19/2023 11:59 PM
8. OBJ8 Extensions (Required for an A) (22 topics)	11/22/2023 12:01 AM - 12/06/2023 11:59 PM

③ Accessible Topic - Topics accessible to visually impaired students using a screen reader.

OBJ1 Collecting and Displaying Data (20 Topics, due on 09/06/2023 11:59 PM)

Estimated Time: 3h 33m

Section 1.1 (2 Topics)

- Differentiating between parameters and statistics (8m)
- Classifying samples (9m) ③

Section 1.2 (3 Topics)

- Classification of variables (3m) ③
- Classification of variables and levels of measurement (9m) ③
- Discrete versus continuous variables (5m) ③

Section 1.3 (4 Topics)

- Choosing units of measurement and an appropriate method to gather data (4m) ③
- Choosing an appropriate method to conduct a survey and making an estimation (7m) ③
- Understanding the differences between designed experiments and observational studies (20m) ③
- Identifying confounders and ways to eliminate them in an observational study (20m) ③

Section 1.4 (1 Topic)

- Identifying and reducing statistical bias (11m) ③

Section 2.1 (3 Topics)

- Interpreting a bar graph (6m)
- Interpreting a double bar graph (8m)
- Interpreting a pie chart (8m)

Section 2.2 (4 Topics)

- Histograms for grouped data (31m)
- Constructing a relative frequency distribution for grouped data (20m) ③
- Interpreting relative frequency histograms (9m)
- Shapes of discrete distributions (6m)

Section 2.3 (1 Topic)

- Interpreting a stem-and-leaf display (5m) ③

Section 2.4 (2 Topics)

- Understanding how adjusting the vertical scale can make a graph misleading (13m) ③
- Understanding how two dimensional graphs can be misleading (11m) ③

Course Readiness (1 Topic)

- Making reasonable inferences based on proportion statistics (12m) ⓘ

Section 3.1 (9 Topics)

- Introduction to summation notation (6m) ⓘ
- Rejecting unreasonable claims based on average statistics (7m) ⓘ
- Weighted mean: Tabular data (9m) ⓘ
- Approximating the mean of a data set given a frequency distribution (20m) ⓘ
- Approximating the mean of a data set given a histogram (18m)
- Mean, median, and mode: Computations (15m) ⓘ
- How changing a value affects the mean and median (17m) ⓘ
- Choosing the best measure to describe data (5m) ⓘ
- Comparing the mean, median, and mode of a data set (13m) ⓘ

Section 3.2 (6 Topics)

- Comparing measures of center and variation (7m) ⓘ
- Using back-to-back stem-and-leaf displays to compare data sets (16m) ⓘ
- Population standard deviation (16m) ⓘ
- Sample standard deviation (15m) ⓘ
- Notation for the population mean, sample mean, population standard deviation, and sample standard deviation (6m)
- Approximating the standard deviation of a data set given a histogram (32m)

Section 3.3 (6 Topics)

- Identifying the center, spread, and shape of a data set (9m) ⓘ
- Five-number summary and interquartile range (10m) ⓘ
- Using the IQR to find outliers in a data set (13m) ⓘ
- Interpreting a box-and-whisker plot (4m) ⓘ
- Constructing a box-and-whisker plot (20m)
- Using box-and-whisker plots to compare data sets (11m) ⓘ

Section 4.1 (2 Topics)

- Linear relationship and the sample correlation coefficient (10m)
- Identifying correlation and causation (9m) ⓘ

Section 4.2 (5 Topics)

- Scatter plots and correlation (4m)
- Interpreting the slope of the least-squares regression line (8m) ⓘ
- Interpreting the equation of the least-squares regression line to make predictions (9m) ⓘ
- Approximating the equation of a line of best fit and making predictions (22m)
- Performing a simple linear regression (30m) ⓘ

Section 4.3 (2 Topics)

- Computing residuals (12m) ⓘ
- Interpreting residual plots (5m)

Chapter 4 Supplementary Topics (1 Topic)

- Classifying linear and nonlinear relationships from scatter plots (3m)

Section 13.3 (1 Topic)

- Interpreting the regression coefficients (8m) ⓘ

Section 3.2 (4 Topics)

- The Empirical Rule for discrete distributions (14m)
- Chebyshev's theorem (25m)
- Using the empirical rule to identify values and percentages of a normal distribution (10m)

- Word problem involving calculations from a normal distribution (10m) ⓘ

Section 3.3 (5 Topics)

- Finding a z-score for a given data value (7m) ⓘ
- Finding a z-score and interpreting it in terms of the population mean and standard deviation (6m) ⓘ
- Comparing the relative sizes of data values based on their z-scores (16m) ⓘ
- Percentage of data below a specified value (6m) ⓘ
- Interpreting percentile ranks (7m) ⓘ

Section 4.2 (1 Topic)

- Relating the sample correlation coefficient and the parameters of the least-squares regression line (29m) ⓘ

Section 5.3 (4 Topics)

- Calculating relative frequencies in a contingency table (5m) ⓘ
- Calculating relative frequencies in a contingency table: Advanced (6m) ⓘ
- Computing conditional probability using a two-way frequency table (11m) ⓘ
- Computing conditional probability using a large two-way frequency table (11m) ⓘ

Section 6.1 (5 Topics)

- Discrete probability distribution: Basic (9m) ⓘ
- Discrete probability distribution: Word problems (7m) ⓘ
- Discrete probability distribution: Word problem involving cumulative probabilities (5m) ⓘ
- Expectation and variance of a random variable (22m) ⓘ
- Introduction to expectation (10m) ⓘ

Section 6.2 (1 Topic)

- Binomial problems: Mean and standard deviation (13m) ⓘ

Chapter 6 Supplementary Topics (5 Topics)

- Rules for expectation and variance of random variables (26m) ⓘ
- Marginal distributions of two discrete random variables (10m) ⓘ
- Joint distributions of dependent or independent random variables (10m) ⓘ
- Probabilities of two random variables given their joint distribution (15m) ⓘ
- Conditional probabilities of two random variables given their joint distribution (18m) ⓘ

Section 7.1 (7 Topics)

- Using the graph of a distribution to find probabilities: Basic (5m) ⓘ
- Using the graph of a distribution to find probabilities: Advanced (15m) ⓘ
- Shading a region and finding its standard normal probability (6m)
- Standard normal probabilities (14m) ⓘ
- Standard normal values: Basic (12m) ⓘ
- Standard normal values: Advanced (14m) ⓘ
- Normal versus standard normal curves (10m)

Section 7.2 (4 Topics)

- Normal distribution: Finding a probability, basic (14m) ⓘ
- Normal distribution: Finding a probability, advanced (17m) ⓘ
- Normal distribution: Finding a raw score (16m) ⓘ
- Normal distribution: Finding a mean or standard deviation (20m) ⓘ

Section 7.6 (1 Topic)

- Drawing a normal quantile plot and using it to assess normality (16m) ⓘ

Section 13.2 (1 Topic)

- Simple linear regression: Explained and unexplained variation (17m) ⓘ

OBJ5 The CLT and Sampling Distribution (7 Topics, due on 10/25/2023 11:59 PM)

Estimated Time: 1h 31m

Section 7.3 (4 Topics)

- The sampling distribution of the sample mean (13m)
- Understanding the histogram of the sampling distribution of the sample mean (8m) ⓘ
- Sampling distribution of the sample mean: Mean and standard deviation (8m) ⓘ

- Central limit theorem: Sample mean (19m) ⓘ

Section 7.4 (3 Topics)

- Notation for the population proportion and sample proportion (8m) ⓘ
- Sampling distribution of a sample proportion: Mean and standard deviation (6m) ⓘ
- Central limit theorem: Sample proportion (29m) ⓘ

OBJ6 Confidence Intervals (17 Topics, due on 11/06/2023 11:59 PM)

Estimated Time: 3h 46m

Section 8.1 (5 Topics)

- Comparing confidence intervals for the population mean when the population standard deviation is known (19m) ⓘ
- Computing and comparing confidence intervals for the population mean when the population standard deviation is known (25m) ⓘ
- Introduction to constructing a confidence interval for a population mean using the standard normal distribution (11m) ⓘ
- Constructing a confidence interval to test a claim about the population mean: Standard normal (13m) ⓘ
- Confidence interval for the population mean: Use of the standard normal (17m) ⓘ

Section 8.2 (7 Topics)

- Introduction to the t distribution (5m) ⓘ
- Introduction to finding the value that cuts off a given area under the curve: t distribution (4m) ⓘ
- t distribution (17m) ⓘ
- Introduction to constructing a confidence interval for a population mean using the t distribution (7m) ⓘ
- Constructing a confidence interval to test a claim about the population mean: t distribution (9m) ⓘ
- Confidence interval for the population mean: Use of the t distribution (20m) ⓘ
- Choosing an appropriate sample size (15m) ⓘ

Section 8.3 (4 Topics)

- Computing and comparing confidence intervals for a population proportion (24m) ⓘ
- Introduction to constructing a confidence interval for a population proportion (8m) ⓘ
- Constructing a confidence interval to test a claim about a population proportion (8m) ⓘ
- Confidence interval for a population proportion (14m) ⓘ

Section 8.5 (1 Topic)

- Selecting appropriate distributions for constructing confidence intervals for the population mean (10m) ⓘ

OBJ7 Hypothesis Testing (19 Topics, due on 11/19/2023 11:59 PM)

Estimated Time: 5h 32m

Section 9.1 (2 Topics)

- Determining null and alternative hypotheses for a test of a population mean (7m) ⓘ
- Determining null and alternative hypotheses for a test of a population proportion (4m) ⓘ

Section 9.2 (7 Topics)

- Introduction to performing a hypothesis test: Critical value method (8m) ⓘ
- Introduction to performing a hypothesis test: p value method (10m) ⓘ
- Introduction to hypothesis tests for the population mean using the critical value method: Z test (22m) ⓘ
- Introduction to hypothesis tests for the population mean using the p value method: Z test (23m) ⓘ
- Hypothesis test for the population mean: Z test using the critical value method (25m) ⓘ
- Hypothesis test for the population mean: Z test using p values (22m) ⓘ
- Understanding how the choice of a level of significance affects the results of a hypothesis test using the critical value method (18m) ⓘ

Section 9.3 (4 Topics)

- Introduction to hypothesis tests for the population mean using the critical value method: t test (21m) ⓘ
- Introduction to hypothesis tests for the population mean using the p value method: t test (23m) ⓘ
- Hypothesis test for the population mean: t test using the critical value method (18m) ⓘ
- Hypothesis test for the population mean: t test using the p value method (17m) ⓘ

Section 9.4 (5 Topics)

- Finding the value of the test statistic for a hypothesis test for a population proportion (13m) ⓘ
- Introduction to hypothesis tests for a population proportion using the critical value method (22m) ⓘ
- Introduction to hypothesis tests for a population proportion using the p value method (25m) ⓘ
- Hypothesis test for a population proportion using the critical value method (16m) ⓘ
- Hypothesis test for a population proportion using the p value method (17m) ⓘ

Section 9.6 (1 Topic)

- Choosing and calculating test statistics for hypothesis tests on the population mean (21m) ⓘ

OBJ8 Extensions (Required for an A) (22 Topics, due on 12/06/2023 11:59 PM)

Estimated Time: 6h 40m

Section 8.4 (3 Topics)

- Introduction to the chi-square distribution (3m) ⓘ
- Introduction to finding the value that cuts off a given area under the curve: chi-square distribution (3m) ⓘ
- Chi-square distribution (10m) ⓘ

Section 9.1 (2 Topics)

- Determining null and alternative hypotheses for a test of a population variance or standard deviation (7m) ⓘ
- Type I and Type II errors (12m)

Section 10.2 (1 Topic)

- Confidence interval for the difference in population means: Paired comparisons (20m) ⓘ

Section 11.1 (2 Topics)

- Hypothesis test for the difference of population means: Z test (30m) ⓘ
- Hypothesis test for the difference of population means: t test for populations with equal variances (29m) ⓘ

Section 11.2 (2 Topics)

- Determining whether two samples are independent or paired and the test statistic for a hypothesis test for the difference of two population means (29m) ⓘ
- Hypothesis test for the difference of population means: Paired comparisons (30m) ⓘ

Section 12.1 (1 Topic)

- Chi-square goodness-of-fit test (30m) ⓘ

Section 12.2 (2 Topics)

- Contingency tables: Expected frequencies (9m) ⓘ
- Chi-square test of independence (30m) ⓘ

Section 13.2 (1 Topic)

- Simple linear regression: Explained and unexplained variation (17m) ⓘ

Section 13.3 (1 Topic)

- Interpreting the regression coefficients (8m) ⓘ

Chapter 13 Supplementary Topics (1 Topic)

- Identifying degrees of freedom (6m) ⓘ

Section 14.1 (3 Topics)

- ANOVA: Mean squares and the common population variance (20m) ⓘ
- ANOVA: Degrees of freedom and the F statistic (13m) ⓘ
- ANOVA: Hypothesis tests and the ANOVA table (33m) ⓘ

Chapter 14 Supplementary Topics (1 Topic)

- Selecting among t tests and ANOVA tests (19m) ⓘ

Section 15.1 (1 Topic)

- Sign test (18m)

Section 15.3 (1 Topic)

- Wilcoxon signed-ranks test (24m)