ALEKS®

Business Statistics

This course covers the topics outlined below. You can customize the scope and sequence of this course to meet your curricular needs.

Curriculum Show All (137 topics + 24 additional topics)

- Mathematical Readiness (19 topics)
  - ♦ Arithmetic Readiness (10 topics)
    - ◊ Order of operations with whole numbers
    - ◊ Order of operations with whole numbers and grouping symbols
    - ◊ Decimal place value: Hundreds to ten thousandths
    - ◊ Rounding decimals
    - ◊ Converting between percentages and decimals
    - ◊ Finding a percentage of a whole number without a calculator: Basic
    - ◊ Writing a ratio as a percentage without a calculator
    - ◊ Converting a percentage to a fraction in simplest form
    - ◊ Converting a fraction to a percentage: Denominator of 20, 25, or 50
    - ◊ Summation of indexed data
  - ♦ Algebra Readiness (9 topics)
    - ◊ Solving a two−step equation with integers
    - ◊ Solving a linear equation with several occurrences of the variable: Variables on the same side and distribution
    - ◊ Solving a linear equation with several occurrences of the variable: Variables on both sides and distribution
    - ◊ Y−intercept of a line
    - ◊ X− and y−intercepts of a line given the equation in standard form
    - ◊ Writing the equation of a line given the y−intercept and another point
    - ◊ Graphing a line given its x− and y−intercepts
    - ◊ Graphing a line given its equation in slope−intercept form
    - ◊ Graphing a line through a given point with a given slope
- Descriptive Statistics (22 topics)
  - ♦ Graphical Displays (11 topics)
    - ◊ Interpreting a pie chart
    - ◊ Computations from pie charts
    - ◊ Interpreting a double bar graph
    - ◊ Histograms for grouped data
    - ◊ Frequency polygons for grouped data
    - ◊ Interpreting relative frequency histograms
    - ◊ Cumulative distributions and ogives
    - ◊ Comparing means without calculation
    - ◊ Comparing standard deviations without calculation
    - ◊ Constructing a box−and−whisker plot
    - ◊ Interpreting a stem−and−leaf display
  - ♦ Descriptive Measures (11 topics)
    - ◊ Mean, median, and mode: Computations
    - ◊ Rejecting unreasonable claims based on average statistics

- ◊ Weighted mean: Tabular data
- ◊ Approximating the mean of a data set given a histogram
- ◊ Percentiles
- ◊ Population standard deviation
- ◊ Sample standard deviation
- ◊ Approximating the standard deviation of a data set given a histogram
- ◊ Chebyshev's theorem and the empirical rule
- ◊ Mean, median, and mode: Comparisons
- ◊ Making reasonable inferences based on proportion statistics

• Probability (18 topics)

♦ Counting (5 topics)

- ◊ Factorial expressions
- ◊ Combinations
- ◊ Permutations
- ◊ Permutations, combinations, and the multiplication principle for counting
- ◊ Probabilities of draws with replacement

♦ Events and Probability (6 topics)

- ◊ Outcomes and event probability
- ◊ Probabilities involving two rolls of a die: Decimal answers
- ◊ Word problem involving the probability of a union or an intersection
- ◊ Probability of the union and intersection of independent events
- ◊ Probability of the union of mutually exclusive events and independent events
- ◊ Probability of independent events: Decimal answers

♦ Conditional Probability (7 topics)

- ◊ Calculating relative frequencies in a contingency table
- ◊ Conditional probability: Basic
- ◊ Probability of dependent events
- ◊ Intersection and conditional probability
- ◊ Tree diagrams for conditional probabilities
- ◊ Law of total probabilities
- ◊ Bayes' theorem

• Random Variables and Distributions (20 topics)

♦ One Random Variable (5 topics)

- ◊ Classification of variables and levels of measurement
- ◊ Discrete versus continuous variables
- ◊ Discrete probability distribution: Basic
- ◊ Discrete probability distribution: Word problems
- ◊ Expectation and variance of a random variable

♦ Fundamental Distributions (13 topics)

- ◊ Binomial problems: Mean and standard deviation
- ◊ Binomial problems: Basic
- ◊ Binomial problems: Advanced
- ◊ Standard normal probabilities
- ◊ Standard normal values: Basic
- ◊ Standard normal values: Advanced
- ◊ Normal versus standard normal curves
- ◊ Normal distribution: Finding a raw score
- ◊ Normal distribution: Finding a probability, basic
- ◊ t distribution
- ◊ Chi−square distribution
- ◊ F distribution
- ◊ Normal approximation to binomial

♦ Central Limit Theorem (2 topics)

- ◊ Central limit theorem: Sample mean
- ◊ Central limit theorem: Sample proportion

• Confidence Intervals and Hypothesis Testing (20 topics)
- ♦ Confidence Intervals (8 topics)
  - ◊ Selecting a distribution for inferences on the population mean
  - ◊ Confidence interval for the population mean: Use of the standard normal
  - ◊ Confidence interval for the population mean: Use of the t distribution
  - ◊ Confidence interval for a population proportion
  - ◊ Confidence interval for the difference of population means: Use of the standard normal
  - ◊ Confidence interval for the difference of population means: Use of the t distribution for populations with equal variances
  - ◊ Confidence interval for the difference of population proportions
  - ◊ Confidence interval for the ratio of population variances
- ♦ Sample Size, Effect Size, and Power (3 topics)
  - ◊ Choosing an appropriate sample size
  - ◊ Type I and Type II errors
  - ◊ Type ` and Type a errors and power
- ♦ Hypothesis Tests (9 topics)
  - ◊ Determining null and alternative hypotheses
  - ◊ Hypothesis test for the population mean: Z test
  - ◊ Hypothesis test for the population mean: t test
  - ◊ Hypothesis test for a population proportion
  - ◊ Hypothesis test for the difference of population means: Z test
  - ◊ Hypothesis test for the difference of population means: Paired comparisons
  - ◊ Hypothesis test for the difference of population means: t test for populations with equal variances
  - ◊ Hypothesis test for the difference of population proportions
  - ◊ Hypothesis test for the ratio of population variances

• Regression and Correlation (13 topics)
- ♦ Correlation and Simple Linear Regression (7 topics)
  - ◊ Sketching the least−squares regression line
  - ◊ Linear relationship and the sample correlation coefficient
  - ◊ Predictions from the least−squares regression line
  - ◊ Computing the sample correlation coefficient and the coefficients for the least−squares regression line
  - ◊ Explained and unexplained variation and the least−squares regression line
  - ◊ Confidence intervals and prediction intervals from simple linear regression
  - ◊ Hypothesis tests for the correlation coefficient and the slope of the least−squares regression line
- ♦ Multiple Regression (6 topics)
  - ◊ Interpreting the regression coefficients
  - ◊ Identifying degrees of freedom
  - ◊ ANOVA table: Problem type 1
  - ◊ ANOVA table: Problem type 2
  - ◊ F test of a multiple regression model
  - ◊ t test of a multiple regression model

• ANOVA, Chi−square and Nonparametric Tests (12 topics)
- ♦ One−way, Independent−samples ANOVA (3 topics)
  - ◊ ANOVA: Mean squares and the common population variance
  - ◊ ANOVA: Degrees of freedom and the F statistic
  - ◊ ANOVA: Hypothesis tests and the ANOVA table
- ♦ Advanced ANOVA (4 topics)
  - ◊ One−way, repeated−measures ANOVA
  - ◊ Interpreting group means from a factorial design
  - ◊ Two−way, independent−samples ANOVA

- ◊ Selecting among *t* tests and ANOVA tests
- ♦ Chi−square Tests (3 topics)
  - ◊ Contingency tables: Expected frequencies
  - ◊ Chi−square goodness−of−fit test
  - ◊ Chi−square test of independence
- ♦ Non−parametric Tests (2 topics)
  - ◊ Sign test
  - ◊ Wilcoxon signed−ranks test

• Time Series and Quality Control (13 topics)

- ♦ Time Series (6 topics)
  - ◊ Trend lines for yearly data
  - ◊ Seasonal indexes: Multiplicative model
  - ◊ Moving averages
  - ◊ Ratio−to−moving−average method
  - ◊ Exponential smoothing
  - ◊ Regression with seasonal indicators
- ♦ Quality Control (7 topics)
  - ◊ Interpreting a control chart
  - ◊ R charts
  - ◊ x−bar charts
  - ◊ p charts
  - ◊ c charts
  - ◊ Acceptance sampling
  - ◊ Estimating sigma from an R chart

• Other Topics Available(*) (24 additional topics)

- ♦ Descriptive Statistics (2 topics)
  - ◊ Using back−to−back stem−and−leaf displays to compare data sets
  - ◊ Transforming the mean and standard deviation of a data set
- ♦ Probability (11 topics)
  - ◊ Probabilities of draws without replacement
  - ◊ Venn diagrams: Two events
  - ◊ Venn diagrams: Three events
  - ◊ Shading a Venn diagram with 3 sets to represent a group
  - ◊ Probabilities involving two mutually exclusive events
  - ◊ Probabilities involving three mutually exclusive events
  - ◊ Probabilities involving two independent events
  - ◊ Probabilities involving three independent events
  - ◊ The curious die
  - ◊ Conditional probability: Mutually exclusive events
  - ◊ Conditional probability: Independent events
- ♦ Random Variables and Distributions (8 topics)
  - ◊ Cumulative distribution function
  - ◊ Rules for expectation and variance of random variables
  - ◊ Marginal distributions of two discrete random variables
  - ◊ Joint distributions of dependent or independent random variables
  - ◊ Probabilities of two random variables given their joint distribution
  - ◊ Conditional probabilities of two random variables given their joint distribution
  - ◊ Normal distribution: Finding a mean or standard deviation
  - ◊ Central limit theorem: Sample sum
- ♦ Confidence Intervals and Hypothesis Testing (3 topics)
  - ◊ Confidence interval for the population standard deviation

◊ Effect size, sample size, and power
◊ Hypothesis test for the population variance or standard deviation

***Other Topics Available** *By default, these topics are NOT included in the course, but can be added using the content editor in the Teacher Module.*

