# Scope & Sequence

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| Course Name: Statistics and Business Decision Making **TSDS PEIMS Code:** 13016900 | **Course Credit:** 1.0**Course Requirements:** Grade Placement 11-12. **Prerequisites:** Algebra II.  |
| **Course Description:**Statistics and Business Decision Making is an introduction to statistics and the application of statistics to business decision making. Students will use statistics to make business decisions. Students will determine the appropriateness of methods used to collect data to ensure conclusions are valid. |
| **NOTE:** This is a suggested scope and sequence for the course content. This content will work with any textbook or instructional materials. If locally adapted, make sure all TEKS are covered. |
| **Total Number of Periods****Total Number of Minutes****Total Number of Hours** | 175 Periods7875 Minutes131.25 Hours\* | \*Schedule calculations based on 175/180 calendar days. For 0.5 credit courses, schedule is calculated out of 88/90 days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc. |
| **Unit Number, Title, and Brief Description** | **# of Class Periods\***(assumes 45-minute periods)Total minutes per unit | **TEKS Covered****130.190. (c) Knowledge and skills** |
| **Unit 1: Professional Standards and Communication**Students will begin the course by learning and discussing appropriate verbal, nonverbal, and digital communication, professional standards, ethical and legal issues, customer service, and business etiquette. Students will demonstrate their understanding of appropriate communication, ethical and legal decision-making, business etiquette, and customer service by resolving complaints and building customer relationships as they participate in classroom activities, discussions, and/or in workplace vignettes/scenarios. Students will continue to develop and demonstrate appropriate communication and business etiquette skills throughout the course.  | 5 periods225 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:(A) demonstrate an understanding of appropriate communication with customers, employers, and coworkers through verbal, nonverbal, or digital means;(B) demonstrate an understanding of the use of business etiquette;(C) demonstrate an understanding of appropriate customer service such as building customer relationships and resolving customer complaints; and(D) demonstrate an understanding of ethical and legal issues in business. |
| **Unit 2: Statistics in Business**Students will summarize and evaluate how statistics are used in business areas such as accounting, economics, finance, management, and marketing. Students will learn, demonstrate, and explain their understanding of problem-solving models and how to apply their mathematical understanding and skills to the use of statistics. Students will be given multiple opportunities to learn and demonstrate their understanding of the ethical and responsible use of statistics in classroom activities, discussions, projects, and/or presentations. | 25 periods1,125 minutes | (2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:(A) apply mathematics to problems arising in everyday life, society, and the workplace;(B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution; and(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.(4) The student understands and demonstrates the use of statistics in business areas, including accounting, economics, finance, management, and marketing. The student is expected to:(A) evaluate the use of statistics in accounting such as forecasting consumption, earnings, cash flows, book value, and allowance for doubtful accounts;(B) evaluate how statistics are used in economics such as reports for labor market, trade balance, Gross Domestic Product, unemployment, and consumer spending;(C) evaluate how statistics are used in finance such as the use by financial intermediaries or in the evaluation of investments, securities, derivatives, futures, or options;(D) evaluate how statistics are used in management such as in the evaluation of production efficiency, production quantity, quality control, workforce trends, staffing issues, and employee satisfaction; and(E) evaluate how statistics are used in marketing such as reports for projected market share, advertising effectiveness, sales effectiveness, brand loyalty, spending habits, and customer satisfaction.(5) The student understands and demonstrates the ethical and responsible use of statistics in business. The student is expected to evaluate how statistics are used in accounting, economics, finance, management, and marketing. |
| **Unit 3: Statistical Analysis Software**Students will examine and explain the software associated with statistical analysis. Students will examine and assess statistical information and collect, collate, organize, and analyze quantitative data. Students will create and/or use spreadsheets, graphs, diagrams, text, and/or other representations to explain and describe how financial information and using statistical analysis assists in business decision-making.  | 25 periods1,125 minutes  | (2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;(D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate; and(E) create and use representations to organize, record, and communicate mathematical ideas.(7) The student evaluates financial information using statistical analysis to assist business decision making using appropriate software. The student is expected to:(A) communicate the value of statistical information in a variety of business disciplines and environments;(B) assess statistical information portrayed in areas such as advertising, investments and securities, human resource management, and economics;(C) generate a spreadsheet to collect, collate, organize, and analyze quantitative data; and(D) use spreadsheets and graphical techniques to present data in a manner that is understood by and meaningful to colleagues and clients. |
| **Unit 4: Defining, Collecting, and Understanding Data**Students will learn, discuss, and demonstrate defining and collecting data, and create and/or use graphs, diagrams, text, and/or other representations to explain and understand variables, populations and samples, sampling methods, and survey error types. Students will also discuss descriptive measures as well as demonstrate how to organize and visualize categorical data and numerical data. Students will be given multiple opportunities to learn and discuss these topics and to demonstrate their understanding in classroom activities, discussions, projects, and/or presentations.  | 20 periods900 minutes | (2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:(F) analyze mathematical relationships to connect and communicate mathematical ideas; and(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication. (8) The student understands and demonstrates the defining and collecting of data. The student is expected to:(A) define the types of variables and the measurement scales of variables;(B) understand the collecting of data and its source;(C) understand populations and samples;(D) understand sampling methods; and(E) understand and define survey error types.(9) The student will understand and demonstrate the organization and visualization of data. The student is expected to organize and visualize categorical data and numerical data.(10) The student understands and demonstrates the use of descriptive measures. The student is expected to:(A) understand and calculate the central tendency of the data set using mean, median, and mode;(B) understand and determine the variation of the data set using range, sample variance, sample standard deviation, population variance, population standard deviation, coefficient of the variation, and Z score; and(C) understand and demonstrate the measure of shape of the data set using skewness, symmetry, and kurtosis. |
| **Unit 5: Probability**Students will learn, demonstrate, and explain their understanding of problem-solving models and how to apply their mathematical understanding and skills to the use of probability. Students will define and explain terminology associated with probability and statistics, and perform and analyze assigned calculations. Students will be given multiple opportunities to learn and demonstrate their understanding of the use of probability in classroom activities, discussions, projects, and/or presentations. | 25 periods1125 minutes | (2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:(B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution; and(F) analyze mathematical relationships to connect and communicate mathematical ideas.(11) The student understands and demonstrates the use of probability. The student is expected to:(A) define event, compound event, complement of an event, sample space, marginal probability, conditional probability, independence, multiplication rule, multiplication rule for independent events, probability of an event, impendence, and Bayes' Theorem; and(B) define and calculate simple probability, compound probability, marginal probability, general addition rule, marginal probability using the multiplication rule, and probability with Bayes' Theorem.(12) The student understands and demonstrates the use of probability distribution for discrete variables. The student is expected to understand and demonstrate the use of the uniform distribution, the binomial distribution, and the Poisson distribution.(13) The student understands and demonstrates the use of probability distribution for continuous variables. The student is expected to understand and demonstrate the use of the normal distribution, uniform distribution, and exponential distribution. |
| **Unit 6: Sampling and Hypothesis Testing** Students will learn, demonstrate, and explain their understanding of problem-solving models and how to apply their mathematical understanding and skills to the use of sampling distribution, sampling distribution of the mean, and the central limit theorem. Students will define and explain terminology associated with the use and construction of confidence intervals, hypothesis testing, and analysis of variance, and perform and analyze assigned calculations. Students will be given multiple opportunities to learn and demonstrate their understanding of a chi-square test and the use of nonparametric tests in classroom activities, discussions, projects, and/or presentations. | 20 periods900 minutes | (2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:(A) apply mathematics to problems arising in everyday life, society, and the workplace;(D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate; and(F) analyze mathematical relationships to connect and communicate mathematical ideas.(14) The student understands and demonstrates the use of sampling distribution, sampling distribution of the mean, and the central limit theorem. The student is expected to:(A) calculate the population mean and population standard deviation;(B) calculate standard error of the mean; and(C) calculate the Z- and X-bar for the sampling distribution of the mean.(15) The student understands and demonstrates the use and construction of confidence intervals. The student is expected to:(A) construct a confidence interval for the mean for a known and unknown population standard deviation; and(B) evaluate ethical issues associated with confidence intervals.(16) The student understands and demonstrates hypothesis testing for one sample tests and two sample tests. The student is expected to:(A) understand and demonstrate the use of hypothesis testing, null hypothesis, and alternative hypothesis;(B) create a null hypothesis and alternative hypothesis;(C) understand and demonstrate the use of Type I error and Type II error;(D) calculate the level of significance and calculate beta risk;(E) understand and demonstrate the use of the complements of Type I error and Type II error by calculating the confidence coefficient and the power of a statistical test;(F) understand and calculate Z test for the mean;(G) understand and demonstrate hypothesis one-tail tests, critical value, and p-value; and(H) understand and demonstrate hypothesis two-tail tests, critical value, and p-value.(17) The student understands analysis of variance. The student is expected to understand and demonstrate the analysis of more than two populations.(18) The student understands and demonstrates the use of chi-square test. The student is expected to use a chi-square test.(19) The student understands and demonstrates the use of nonparametric test. The student is expected to use nonparametric tests such as the Wilcoxon Sum test. |
| **Unit 7: Linear Regression, Analysis, and Forecasting**Students will learn, demonstrate, and explain their understanding of simple linear regression, multivariable regression, time series analysis, and forecasting. Students will define and explain the terminology as well as the mathematical ideas and processes associated with the use of regression models and components, and perform and analyze assigned calculations. Students will be given multiple opportunities to learn and demonstrate their understanding of the equations, models, and components in classroom activities, discussions, projects, and/or presentations. | 25 periods1,125 minutes | (2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:(F) analyze mathematical relationships to connect and communicate mathematical ideas; and(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication. (20) The student understands simple linear regression. The student is expected to:(A) understand and demonstrate the use of various types of regression models;(B) create the regression equation; and(C) make predictions based on regression models.(21) The student understands an introduction to multivariable regression: The student is expected to use a multivariable regression model.(22) The student understands time series analysis and forecasting. The student is expected to:(A) understand times series models;(B) understand trend component;(C) understand seasonal component; and(D) understand cyclical component. |
| **Unit 8: Risk Management: Strategies, Techniques, and Careers**Students will learn, demonstrate, and explain their understanding of risk management terminology, strategies, and techniques as well as the relationship between risk management and operations. Students will be given multiple opportunities to demonstrate their understanding of risk management in classroom activities, discussions, projects, and/or presentations. Students will explore, identify, and discuss various careers in risk management as well as career-related licensing and certification programs and educational requirements. Students will use diagrams, text, and/or other representations to compare and contrast the fundamentals of risk management, including reasons and benefits, and demonstrate their understanding of the role of ethics as well as responsibilities in risk management in classroom activities, discussions, and/or workplace/occupational task scenarios.  | 15 periods675 minutes | (3) The student uses career planning concepts, tools, and strategies to explore a career in the area of risk management. The student is expected to:(A) compare and contrast the fundamentals of risk management, including the reasons for and benefits of risk management;(B) discuss the role of ethics and responsibility in risk management; and(C) compare and contrast roles, responsibilities, licensing, and certification programs of careers related to managing and analyzing personal and corporate financial portfolios such as financial planners, financial managers, financial analysts, controllers, risk managers, cash managers, treasurers, and chief financial officers. (6) The student evaluates risk-management strategies and techniques in corporate finance to maximize profit and minimize loss. The student is expected to:(A) manage risk to protect business stability;(B) analyze the relationship between risk management and operations; and(C) evaluate various risk-management strategies and techniques, including the use of insurance, stock, derivatives, and options. |
| **Unit 9: Postsecondary Planning** Students will use appropriate technology and/or other materials/activities to research and identify potential career interests and opportunities. Students will research, identify, and use graphs, diagrams, text, and/or other representations to compare beginning and expected future compensation/earnings of potential careers and the costs and requirements associated with postsecondary education. Students will create their postsecondary plans after identifying and comparing current educational, military, and job opportunities. Plans will include resumes and cover letters, educational requirements, relevant application and testing deadlines, and a description of projected living expenses. If time permits, students will research and briefly discuss opportunities and benefits offered via participation in CTSO and/or other extracurricular student activities as a course culmination activity. | 15 periods675 minutes | (2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:(A) apply mathematics to problems arising in everyday life, society, and the workplace. (23) The student demonstrates an understanding of a postsecondary plan. The student is expected to:(A) understand educational, military, and current job opportunities; and(B) create a postsecondary plan that includes topics such as application requirements; testing requirements; certification requirements; associated deadlines; associated costs, including living expenses; job prospects and opportunities; beginning earnings; expected future earnings; and resumes and cover letters. |