Business Statistics

FALL SEMESTER

Week One – Three: Introduction To Business Statistics

Data Distributions & Inductive Reasoning

Financial Literacy Preview

Excel Data Management, Formulas, Functions

Sample Project: Personal Heritage Pizza – Students integrate mathematical symbols, inductive reasoning, art skills, and their understanding of their cultural roots to communicate a reflection of personal passions and family ancestry.

Sample Common Core Math Domain: Understand the concept of a function and use of function notation.

Week Four – Seven: Data Analysis Emphasis

Describe and compare data distributions. Students communicate their statistical findings in graphic, tabular, and written formats using Excel.

Bivariate data analysis – scatter plot, correlation and time series.

Common applications of the six functions of a dollar (e.g. How much can one borrow given an amount of earnings?)

Sample Project: Students select graphic displays from corporate annual reports. Using Excel graphic display tools, students revise these displays to better communicate the corporate message given a variety of externally imposed design parameters.

Sample Common Core Math Domain: Summarize, Represent, and Interpret Data on a Single Count or Measurement Variable

Week Eight – Nine: Mathematical Modeling Emphasis

Students apply data analysis skills while managing their portfolios in the stock market game (e.g. correlation applied in the selection of stocks to increase diversification).

Linear & Non-linear regression models

Observational study design, avoiding bias to maintain inferential conditions

Sample Project: Students create graphical stock price time series, and select a mathematical model to predict future price trends. Students test the accuracy of their models with an analysis of residuals.

Sample Common Core Math Standard: Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, & exponential models.

Week Ten – Fourteen: Probability Emphasis

Probability theory and business applications

Multi-function applications of six functions of a dollar

Previewing executive summary format reports, the proposal

Sample Project: Students develop a risk analysis model to explain stock volatility by integrating their knowledge of discrete random variables, tree diagrams and expected value.

Sample Common Core Math Standard: Using Probability to Make Decisions: Calculate expected values and use them to solve problems, and use probability to evaluate outcomes of decision.

Week Fifteen – Eighteen: Observational Studies Emphasis

Writing executive summary format reports

Implementing observational studies with data analysis

Moving Averages, Market Cycles, Intermediate Price Predictors

Sample Project: Students design and implement observational studies in a wide variety of topics. Findings and conclusions are reported in an executive summary format report.

Sample Common Core Math Domain: Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. Modeling is the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decisions. Quantities and their relationships in physical, economic, public policy, social, and everyday situations can be modeled using mathematical and statistical methods.

Business Statistics

SPRING SEMESTER

Week One – Three: Confidence Intervals Emphasis

Inferential thinking

Confidence Intervals – Means & Proportions

Determining Sample Size

Role of statistics in the "Market Meltdown of 2008"

Sample Project: Students use graphing tools from stockcharts.com to create a timeline that identifies critical events that led to the financial crisis of 2008. This assignment demonstrates how stock chart tools can be used in an economics or history course.

Sample Common Core Math Domain: Making Inferences and Justifying Conclusions - Understand and evaluate random processes underlying statistical experiments and observational studies.

Week Four – Eleven: Tests of Significance Emphasis

Observational studies with inference, collaboration with film classes

One-sample tests of significance, means and proportions

Two-sample tests of significance, means and proportions

Chi-Square tests

More advanced valuation models using Excel

Logarithms connection with non-linear models & stock charts

Candlestick Charts, short-term predictors

Sample Project: In collaboration with Mr. Crossley's film classes, students prepare marketing studies to evaluate the popularity of titles, taglines, and synopses. Their findings are presented in an executive summary format report. Team leaders orally summarize their findings in face-to-face meetings.

Sample Common Core Math Domain: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.

Week Twelve – Eighteen: Integration of Statistical Skills

Culminating Projects

Choosing the appropriate mathematical models

Bond laddering using Excel

Evaluating market myths (e.g. price volatility is correlated with volume of sales)

Advanced Excel Applications TBD

Valuation models using discounted cash flows

Sample Project: Final projects - seniors encouraged to connect this project with their senior project, and juniors encouraged to use this project to investigate possible topics for their senior projects.

Sample Common Core Math Domain: Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. Modeling is the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decisions. Quantities and their relationships in physical, economic, public policy, social, and everyday situations can be modeled using mathematical and statistical methods.

Let's Integrate Instruction!