College of San Mateo
Official Course Outline

1. **COURSE ID:** BUS. 207 **TITLE:** Business Analytics Fundamentals
   Units: 3.0 units **Hours/Semester:** 48.0-54.0 Lecture hours; 96.0-108.0 Homework hours; 144.0-162.0 Total Student Learning hours
   Method of Grading: Grade Option (Letter Grade or Pass/No Pass)
   Recommended Preparation:
   Eligibility for ENGL 100, or Eligibility for ENGL 105

2. **COURSE DESIGNATION:**
   Degree Credit
   Transfer credit: CSU; UC

3. **COURSE DESCRIPTIONS:**
   Catalog Description:
   This course is designed to introduce business students to statistical analysis in order to analyze and transform data into useful information, identify and anticipate trends and outcomes, and ultimately make smarter, data-driven business decisions. The course covers the process, technologies, applications, tools, and skills required to analyze data so that informed and timely decisions can be made. Students will learn the methodologies, techniques, and tools (such as Structured Query Language (SQL), Excel, and Tableau) for visualization, inference, forecasting, optimization, simulation, and data mining.

4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**
   Upon successful completion of this course, a student will meet the following outcomes:
   1. Demonstrate an understanding of how managers use business analytics to formulate and solve business problems to support managerial decision making
   2. Interpret key concepts involved in developing, analyzing and reporting business data
   3. Apply data-driven decisions to optimize business processes
   4. Execute Structured Query Language (SQL) queries to extract and organize data that is stored in relational databases

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**
   Upon successful completion of this course, a student will be able to:
   1. Describe how business analytics is used to solve business problems.
   2. Define key concepts involved in developing, analyzing and reporting business data.
   3. State data-driven decisions to optimize business processes.
   4. Analyze large data sets using Excel and Structured Query Language (SQL).

6. **COURSE CONTENT:**
   Lecture Content:
   Introduction to Spreadsheet Modeling
   - Basic Spreadsheet Modeling: Concepts and Best Practices
   - Cost Projections
   - Breakeven Analysis
   - Decisions Involving the Time Value of Money

   Describing the Distribution of a Variable
   - Populations and Samples
   - Data Sets, Variables, and Observations
   - Data Types

   Relationships among Categorical Variables
   - Stacked and Unstacked Formats

   Relationships among Numeric Variables
   - Scatterplots
   - Correlation and Covariance
   - Pivot Tables

   Business Intelligence (BI) Tools for Data Analysis
   - Importing Data into Excel with Power Query
   - Introduction to Relational Databases

- Excel's Data Model
- Creating and Editing Queries

Data Analysis with Pivot Tables

- Basing Pivot Tables on a Data Model

Data Cleansing

Probability and Probability Distributions

- Probability Distribution of a Random Variable
- The Normal Distribution
- The Binomial Distribution
- The Poisson and Exponential Distributions

Decision Making under Uncertainty

- Elements of Decision Analysis
- EMV and Decision Trees
- One-Stage Decision Problems

Sampling and Sampling Distributions

- Methods for Selecting Random Samples
- Introduction to Estimation

Confidence Interval Estimation

- Sampling Distributions
- Confidence Interval for a Mean
- Confidence Interval for a Total
- Confidence Interval for a Proportion
- Confidence Interval for a Standard Deviation
- Confidence Interval for the Difference between Means
- Confidence Interval for the Difference between Proportions
- Sample Size Selection

Hypothesis Testing

- Concepts in Hypothesis Testing
- Hypothesis Tests for a Population Mean
- Chi-Square Test for Independence

Regression Analysis: Estimating Relationships

- Scatterplots: Graphing Relationships
- Correlations: Indicators of Linear Relationships
- Multiple Regression
- Validation of the Fit

Regression Analysis: Statistical Inference

- The Statistical Model
- Inferences about the Regression Coefficients
- Outliers

Time Series Analysis and Forecasting

- Testing for Randomness
- Regression-Based Trend Models
- The Random Walk Model
- Moving Averages Forecasts

Introduction to Optimization Modeling

- A Two-Variable Product Mix Model
- Sensitivity Analysis
- Properties of Linear Models
- Infeasibility and Unboundedness

Optimization Models

- Blending Models
- Logistics Models
- Aggregate Planning Models

Introduction to Simulation Modeling

- Probability Distributions for Input Variables
- Simulation with Built-in Excel Tools

Simulation Models

- Operations Models
- Financial Models
- Marketing Models

- Simulating Games of Chance

7. **REPRESENTATIVE METHODS OF INSTRUCTION:**
   Typical methods of instruction may include:
   A. Lecture
   B. Activity
   C. Discussion
   D. Guest Speakers

8. **REPRESENTATIVE ASSIGNMENTS**
   Representative assignments in this course may include, but are not limited to the following:
   Writing Assignments:
   A. Discussion posts, including peer evaluation of key business analysis concepts.
   B. Chapter practice problems.
   Reading Assignments:
   A. One chapter of college level textbook per week.
   B. Weekly chapter study guide including key concepts, videos, and additional support documents.

9. **REPRESENTATIVE METHODS OF EVALUATION**
   Representative methods of evaluation may include:
   A. Class Participation
   B. Class Work
   C. Exams/Tests
   D. Oral Presentation
   E. Projects
   F. Quizzes

10. **REPRESENTATIVE TEXT(S):**
    Possible textbooks include:
    A. Albright, S. *Business Analytics: Data Analysis & Decision Making*, 7th ed. Cengage, 2020

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Course Originator: Philip Tran