# Course Competency

**CAP 1788 Introduction to Data Analytics**

**Course Description**

This course offers a broad introduction to data analytics and the role it plays in modern organizations. Students will use Excel and Tableau to import, clean, transform, and visualize data. Students will also learn how to effectively communicate findings to decision makers. (3 hr. lecture; 2 hr. lab).

| Course Competency | Learning Outcomes |
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| **Competency 1:**The student will demonstrate an understanding of business intelligence and data analytics by: | 1. Communication<br>2. Numbers / Data<br>3. Critical thinking<br>4. Computer / Technology Usage |
| 1. a) Describing the need for decision support and analytics in business. b) Describing the business intelligence framework. c) Defining descriptive, predictive, and prescriptive analytics. d) Describing the process of formulating and testing a hypothesis. e) Identifying the tools, software and services used by data analysts. f) Describing the challenges and opportunities of technologies such as cloud computing, IoT, and location-based services. g) Exploring legal and ethical issues in analytics. | |
| **Competency 2:**The student will demonstrate an understanding of the different types of data, measurement scales, and data storage technologies by: | 1. Communication<br>2. Numbers / Data<br>3. Critical thinking<br>4. Computer / Technology Usage |
| 1. a) Defining data, information, and knowledge. b) Describing data collection, including the difference between populations and samples. c) Describing the | |

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| difference between cross-sectional and time series data. d) Exploring structured and unstructured data, and describing the challenges of working with the latter. e) Defining big data and describing the unique challenges posed by large volumes of data f) Defining variables and values. g) Identifying numerical (quantitative) and categorical (qualitative) variables. h) Exploring the types of numerical variables and measurement scales. i) Describing the structure of relational databases (tables, keys, relationships, etc.) and how the SQL language can be used to query them. j) Identifying the characteristics of data marts, data warehouses, and data lakes. k) Describing how open data, API's, and web scraping can be useful to analysts. l) Explaining the need for reliable data sets for analytics and the importance of the data wrangling process. | |
| **Competency 3:**The student will import, organize, clean, transform, and explore data using Excel by: | 1. Numbers / Data<br>2. Critical thinking<br>3. Computer / Technology Usage |
| 1. a) Exploring the Excel interface, entering and deleting data, formatting values (text, numbers, dates, etc.), and applying conditional formatting. b) Creating a table with a total row and applying various types of filters and sorts c) Creating formulas with various math operators. d) Using statistical, text, and analysis functions including SUM, AVERAGE, MEDIAN, MIN, MAX, COUNT, COUNT, COUNTA, COUNTBLANK, COUNTIF, IF, TRIM, LEFT, RIGHT, LEN, and SEARCH. e) Applying various paste options, using the fill handle, and using absolute references when applicable. f) Using the Recommended Charts feature to create Column, Bar, Line, and Pie charts. g) Applying documentation to a | |

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| spreadsheet using notes and comments. h) Importing CSV and JSON files using PowerQuery. i) Converting text to numbers or dates when necessary. j) Creating and manipulating PivotTables to explore data in various ways. | |
| **Competency 4:**The student will create visualizations and dashboards using Tableau by: | 1. Numbers / Data<br>2. Critical thinking<br>3. Computer / Technology Usage |
| 1. a) Exploring the Tableau interface, identifying dimensions and measures, and describing the purpose of different shelves. b) Loading data from a variety of sources including text files, Excel workbooks, databases, and cloud sources. c) Describing the Tableau paradigm of connecting to a data source and saving a file as packaged workbook. d) Creating a variety of charts such as bar, stacked bar, bar in bar, line, dual-axis line, heat map, tree map, pie chart, histogram, and scatterplot. e) Creating geographic visualizations such as filled map, symbol map, and density map f) Formatting visualizations (number formatting, color scale, etc.). g) Filtering data in the data source and inside a visualization. h) Transforming data (different data types, continuous vs. discrete data, date parts vs. date values, etc.). i) Creating row-level, aggregate, and basic table calculations. j) Using parameters to allow users to define a reference line. k) Building an interactive dashboard with filter and highlight actions. l) Creating a story with multiple visualizations and dashboards. | |
| **Competency 5:**The student will demonstrate an understanding of storytelling with data by: | 1. Communication<br>2. Numbers / Data<br>3. Critical thinking<br>4. Computer / Technology Usage |

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| 1. a) Describing how storytelling is affected by the needs of the audience and/or decision makers. b) Writing various types of business questions. c) Choosing an effective visual that addresses a business question. d) Describing fundamental aesthetic issues for visuals. e) Identifying strategies to focus an audience's attention. f) Identifying effective presentation strategies and common pitfalls. g) Creating and delivering a live presentation that targets decision makers. | |

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