



### **Course Description**

#### **CAP4744 | Data Visualization | 4.00 credits**

This course focuses on creating complex and informative visualizations using Tableau. Students will learn how to formulate business questions, organize complex and large datasets, analyze and interpret data, deliver actionable insights, and publish the results. Coverage includes preparation for intermediate-level Tableau certifications. Prerequisites: CAP1788 and CAP2761C.

### **Course Competencies:**

**Competency 1:** The student will demonstrate the ability to connect to various data sources by:

1. Describing different types of data sources and how Tableau queries these sources
2. Choosing between a live connection and an extract
3. Connecting to extracts
4. Connecting to spreadsheets and text files
5. Connecting to hypernode files
6. Connecting to relational databases and pulling data by using custom SQL queries
7. Connecting to a data source on Tableau Server
8. Replacing the connected data source with another data source for an existing chart or sheet

**Competency 2:** The student will demonstrate the ability to prepare and transform data by:

1. Identifying the various features and capabilities of Tableau Prep
2. Assessing data quality (completeness, consistency, accuracy)
3. Performing various types of cleaning operations
4. Organizing data into folders
5. Using multiple data sources
6. Preparing data by using Data Interpreter, pivot, and split
7. Applying extract filters
8. Choosing which data transformation to perform based on a business scenario
9. Combining data by using unions and joins
10. Shaping data by using aggregations and pivots
11. Changing default field properties (types, sorting, etc.), renaming columns, and creating aliases
12. Choosing when to convert between discrete and continuous, and dimension and measure

**Competency 3:** The student will demonstrate ability to perform calculations by:

1. Creating calculated fields
2. Using numeric, date, string, and type conversion functions
3. Using logical and Boolean expressions (If, case, nested, etc.)
4. Creating aggregate calculations and contrasting them with row-level calculations
5. Creating FIXED level of detail calculations
6. Creating quick table calculations such as moving average, percent of total, running total, difference and percent of difference, percentile and compound growth rate
7. Creating custom table calculations such as Year to date, Month to date, Year over year, Index and Ranking

**Competency 4:** The student will demonstrate the ability to explore and analyze data by:

1. Applying filters to dimensions and measures
2. Configuring filter settings such as Top N, Bottom N, include, exclude, wildcard, and conditional
3. Applying filters to multiple sheets and data sources

4. Creating parameters to enable interactivity in calculations, with filters and with reference lines
5. Structuring data in Sets, Bins, Hierarchies and Groups
6. Applying the tools in the Analytics pane such as totals and subtotals, reference lines, reference bands, average lines, trend lines, and distribution bands
7. Creating and customizing a data forecasting model
8. h) Creating a predictive model

**Competency 5:** The student will demonstrate the ability to design a visualization by:

1. Creating various charts from scratch such as bar, line, pie, heat map, highlight table, scatter plot, histogram, tree map, bubbles, word clouds, Gantt, box plots, bullet, area, dual axis, and combo
2. Mapping data geographically using symbol maps, heat maps, density maps, and filled maps
3. Customizing various aspects of each chart
4. Creating dashboards and stories
5. Combining sheets into a dashboard by using containers and layout options
6. Adding objects to a dashboard
7. Adding interactivity to dashboards including filters, URLs, highlight actions, parameters, and navigation buttons
8. Formatting visualizations and dashboards, including color, font, shapes, styling, border, and shading
9. Adding custom shapes, color palettes, annotations, and tooltips
10. Applying responsive design for specific device layouts

**Competency 6:** The student will demonstrate an understanding of publishing and managing content on Tableau Server and Tableau Online by:

1. Publishing content such workbooks and data sources
2. Exporting content
3. Scheduling data updates, data extract refreshes, and Tableau Prep workflows
4. Managing published workbooks. e) Creating alerts and subscriptions

**Learning Outcomes:**

- Use quantitative analytical skills to evaluate and process numerical data
- Solve problems using critical and creative thinking and scientific reasoning
- Use computer and emerging technologies effectively