

# IT-2080: DATA VISUALIZATION

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## Cuyahoga Community College

### Viewing: IT-2080 : Data Visualization

#### Board of Trustees:

March 2023

#### Academic Term:

Fall 2023

#### Subject Code

IT - Information Technology

#### Course Number:

2080

#### Title:

Data Visualization

#### Catalog Description:

Create static and dynamic data visualizations using a current visualization tool. Work with large data sets while learning how to create various charts and graphs.

#### Credit Hour(s):

4

#### Lecture Hour(s):

3

#### Lab Hour(s):

2

## Requisites

#### Prerequisite and Corequisite

IT-1025 Information Technology Concepts for Programmers, and IT-2070 Introduction to Data Science and Analytics or concurrent enrollment, and IT-2351 Enterprise Database Systems.

## Outcomes

#### Course Outcome(s):

Create visualizations using a modern visualization tool, data source(s), and an appropriate visualization type.

#### Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

#### Objective(s):

1. Use a current visualization tool.
2. Import data into a visualization tool.
3. Explain various ways to present data.
4. Create a visualization from queried data.
5. Save, export or publish a visualization.

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#### Course Outcome(s):

Apply filters and group data to present relevant and/or summarized data.

#### Essential Learning Outcome Mapping:

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

**Objective(s):**

1. Sort data using multiple sort levels.
2. Group data using existing and calculated field values.
3. Filter records to limit the display.

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**Course Outcome(s):**

Apply various types of calculations to create new fields, make data more presentable, and provide additional information.

**Essential Learning Outcome Mapping:**

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

**Objective(s):**

1. Code aggregated calculations.
2. Apply numerous types of calculations including string, number and date calculations.
3. Explain and/or demonstrate various ways to apply calculations using a modern visualization tool.

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**Course Outcome(s):**

Construct dashboards, stories, or other advanced presentation types that combine multiple visualizations to deliver comprehensive visual insight.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Explain correct uses of dashboards and stories.
2. Build a dashboard that combines multiple visualizations into a single user interface.
3. Create a story that walks through multiple visualizations.

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**Methods of Evaluation:**

- a. Participation and discussion
- b. Online research
- c. Written reports
- d. Demonstrations
- e. Projects
- f. Tests
- g. Quizzes

**Course Content Outline:**

- a. Getting Started
  - i. Review Microsoft's Power Platform and where Power BI fits
  - ii. Download and install Power BI desktop
  - iii. Login to Power BI online
- b. Working with data
  - i. Getting started with data
  - ii. Import data into a visualization tool
  - iii. Explain various ways to present data
  - iv. Create a visualization from queried data
  - v. Save and export visualizations
- c. Modeling
  - i. Create and manage relationships
  - ii. Create a new field with calculated columns
  - iii. Optimize data by hiding fields and sorting visualization data
  - iv. Create a measure to perform calculations on data

- v. Use a calculated table to create a relationship between two tables
- vi. Format time-based data
- d. Visuals
  - i. Introduction to visuals in Power BI
  - ii. Create and customize simple visualizations
  - iii. Create slicers
  - iv. Map visualizations
  - v. Matrices and tables
- e. Charts and page layouts
  - i. Scatter charts
  - ii. Waterfall & funnel charts
  - iii. Gauges and single-number cards
  - iv. Shapes
  - v. Text boxes & images
  - vi. Page layout and formatting
- f. Dashboards
  - i. Building a dashboard
  - ii. Quick insights
  - iii. Dashboard formatting
  - iv. Text boxes and images
- g. Reports
  - i. Create a new report
  - ii. Connect to data sources
  - iii. Clean and transform data
  - iv. Import, transform & sort data
  - v. Save a report
- h. Publishing & Sharing
  - i. Publish reports
  - ii. Print and export reports
  - iii. Build apps
  - iv. Integrate with OneDrive
  - v. Publish to the web

## Resources

Alberto Ferrari and Mario Russon. (2016) *Introducing Microsoft Power BI*, Microsoft Press.

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Microsoft. *Microsoft Learn for Power BI*. [https://learn.microsoft.com/en-us/training/powerplatform/power-bi?WT.mc\\_id=powerbi\\_landingpage-docs-link](https://learn.microsoft.com/en-us/training/powerplatform/power-bi?WT.mc_id=powerbi_landingpage-docs-link)

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Microsoft. *Learn Power BI*, <https://powerbi.microsoft.com/en-gb/learning/>

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Deckler, Powell, Gordon. (2022) *Mastering Microsoft Power BI*, Packt Publishing.

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O'Connor, Erin. (2018) *Microsoft Power BI Dashboards Step by Step*, Microsoft Press.

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