

IT-2081: DATA VISUALIZATION

Cuyahoga Community College

Viewing: IT-2081 : Data Visualization

Board of Trustees:

March 2026

Academic Term:

Fall 2026

Subject Code

IT - Information Technology

Course Number:

2081

Title:

Data Visualization

Catalog Description:

Design and build static and dynamic data visualizations using modern visualization tools. Analyze large data sets and create charts, graphs, and dashboards to support data-driven decision-making.

Credit Hour(s):

3

Lecture Hour(s):

2

Lab Hour(s):

2

Requisites

Prerequisite and Corequisite

IT-1026 Introduction to Computing, and IT-2070 Introduction to Data Science and Analytics or concurrent enrollment, and IT-2352 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.

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.

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.

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.

Methods of Evaluation:

1. Participation and discussion
2. Online research
3. Written reports
4. Demonstrations
5. Projects
6. Tests
7. Quizzes

Course Content Outline:

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

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

Religious Accommodation

Before reviewing the course schedule, students should carefully review the following religious accommodation policy and other required instructional policies:

Religious Accommodation:

Students seeking an accommodation for absences permitted under Ohio's Testing Your Faith Act must provide the instructor with written notice of the specific dates for which the student requires an accommodation and must do so not later than fourteen (14) days after the first day of instruction. Please submit requests for accommodations at this link: <https://portal2.tri-c.edu/ReligiousAccommodation/> Religious Accommodation Form. Students with questions about their religious accommodations under Ohio's Testing Your Faith Act may contact the College's Office of General Counsel and Legal Services by phone at 216.987.4856 or via email at legal@tri-c.edu.

Other Required Instructional Policies:

<https://www.tri-c.edu/student-resources/curriculum/documents/syllabus-part-b.pdf>

Weekly Schedule

	Topics
Week 1	Class Introduction and Getting Started with Power BI (Download and Install Power BI)
Week 2	Getting Started with Power BI Continued
Week 3	Working with Data
Week 4	Working with Data Continued and Lab
Week 5	Data Modeling

Week 6	Working with Relationships and Lab
Week 7	Advanced Modeling & Time-Based Data
Week 8	Advanced Modeling & Time-Based Data Continued and Lab
Week 9	Visuals: Bringing Data to Life
Week 10	Charts and Page Layouts
Week 11	Charts and Page Layouts
Week 12	Charts and Page Layouts Continued and Lab
Week 13	Dashboards and Reports
Week 14	Dashboards and Reports Continued and Lab
Week 15	Publishing and Sharing Insights
Week 16	Final Exam

The Course Schedule is subject to change due to pedagogical needs, instructor discretion, parts of term, and unexpected events.

Required/Recommended Readings

1. Getting Data tutorial: <https://docs.microsoft.com/en-us/power-bi/guided-learning/gettingdata> (<https://docs.microsoft.com/en-us/power-bi/guided-learning/gettingdata/>)
2. Importing the Northwind database: <https://docs.microsoft.com/en-us/power-bi/desktop-connect-odata> (<https://docs.microsoft.com/en-us/power-bi/desktop-connect-odata/>)
3. Anatomy of the Northwind Database (<https://catalog.tri-c.edu/content/enforced/54608-83154.202580/Anatomy%20of%20the%20Northwind%20Database.pdf>)
4. Configure a Semantic Model in Power BI Desktop - Training | Microsoft Learn (<https://learn.microsoft.com/en-us/training/modules/configure-semantic-model-power-bi/>)
5. Learn DAX basics in Power BI Desktop - Power BI | Microsoft Learn (<https://learn.microsoft.com/en-us/power-bi/transform-model/desktop-quickstart-learn-dax-basics/>)
6. Create a Calculated Column (<https://learn.microsoft.com/en-us/power-bi/transform-model/desktop-tutorial-create-calculated-columns/>)
7. Power BI Calculated Fields vs. Measures
8. Optimization guide for Power BI - Power BI | Microsoft Learn (<https://learn.microsoft.com/en-us/power-bi/guidance/power-bi-optimization/>)
9. Create and Manage Relationships in Power BI Desktop - Power BI | Microsoft Learn (<https://learn.microsoft.com/en-us/power-bi/transform-model/desktop-create-and-manage-relationships/>)
10. How to Hide a Column in a Power BI Table Visual (<https://www.thebricks.com/resources/guide-how-to-hide-a-column-in-power-bi-table-visual/>)
11. Implementing time-based calculations in Power BI (<https://learn.microsoft.com/en-us/power-bi/transform-model/desktop-time-intelligence/>)
12. Using Copilot to write DAX queries (<https://learn.microsoft.com/en-us/dax/dax-copilot/>)
13. Work with multidimensional models in Power BI (<https://learn.microsoft.com/en-us/power-bi/connect-data/desktop-default-member-multidimensional-models/>)
14. Waterfall and Funnel Charts (<https://learn.microsoft.com/en-us/training/paths/power-bi-effective/?tutorial-step=8>)
15. Using Visuals in Power BI (<https://learn.microsoft.com/en-us/training/paths/power-bi-effective/?tutorial-step=8>) (Introduction – Matrices and Tables)
16. A Gauge Example - <https://docs.microsoft.com/en-us/power-bi/visuals/power-bi-visualization-radial-gauge-charts> (<https://docs.microsoft.com/en-us/power-bi/visuals/power-bi-visualization-radial-gauge-charts/>)
17. Measures - <https://docs.microsoft.com/en-us/power-bi/desktop-tutorial-create-measures> (<https://docs.microsoft.com/en-us/power-bi/desktop-tutorial-create-measures/>)
18. CALCULATE() - <https://docs.microsoft.com/en-us/dax/calculate-function-dax> (<https://docs.microsoft.com/en-us/dax/calculate-function-dax/>)
19. ALL() - <https://docs.microsoft.com/en-us/dax/all-function-dax> (<https://docs.microsoft.com/en-us/dax/all-function-dax/>)
20. Dashboards, quick insights, and queries
21. Power BI Natural Language Query (<https://www.excelmojo.com/power-bi-natural-language-query/>)
22. Using natural language to explore data with Power BI (<https://learn.microsoft.com/en-us/power-bi/natural-language/q-and-a-intro/>)
23. Design Power BI Reports (<https://learn.microsoft.com/en-us/training/modules/power-bi-effective-reports/>)
24. Collaborate and share Power BI reports and dashboards (<https://learn.microsoft.com/en-us/power-bi/collaborate-share/service-share-dashboards/>)

Resources for the Instructor

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

Microsoft. *Microsoft Learn for Power BI*. Microsoft, 2025. https://learn.microsoft.com/en-us/training/powerplatform/power-bi?WT.mc_id=powerbi_landingpage-docs-link

Microsoft. (2025) *Learn Power BI*, Microsoft. <https://powerbi.microsoft.com/en-gb/learning/>

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

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

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