



MERCER
COUNTY COMMUNITY COLLEGE

COURSE OUTLINE

Course Number	Course Title	Credits
IST 275	Data Analytics and Visualization	3
Hours: Lecture/Lab/Other	Co- or Pre-requisite	Implementation Semester & Year
2/2/0	CIS175 PC Applications: Spreadsheets (or appropriate Excel experience)	Fall 2023

Catalog description: Students will acquire a detailed knowledge of descriptive statistics while learning how to use MS Excel to clean, manipulate, and interpret real world data sets with the goal of creating readable, well-constructed data visualization dashboards.

General Education Category: Not GenEd	Course coordinator: Rubana Syed 609-570-3475 syedr@mccc.edu
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Required texts & Other materials:

- Data Visualization with Excel Dashboards and Reports (978-1119698722)
- Microsoft Excel 2016 or later

Course Student Learning Outcomes (SLO):

Upon successful completion of this course the student will be able to:

1. Identify different types of data related to business and economic problems (discrete, continuous, categorical, time series) and know the appropriate chart types (scatterplot, histogram, run chart, etc.) for visualizing each [Supports ILGs #2, 5,11]
2. Demonstrate the ability to clean and prepare real world spreadsheet data for analysis with MS Excel [Supports ILG#4, 10]
3. Effectively use MS Excel's most fundamental analytics tools (vlookup, arithmetic functions, pivot tables/charts, charting tools) to perform data analyses [Supports ILG #4, 11]
4. Apply advanced charting formatting features (dual axis charts, conditional formatting rules) to create intuitive, aesthetically appealing visualizations [Supports ILG#4]
5. Tell a meaningful story with data by creating a visualization dashboard composed of many visual elements of all types (charts, tables, reports) [Supports ILG #s 1, 5,11]
6. Present data visualizations to an audience, describe the most important elements of the data, and confidently respond to questions about the data [Supports ILG #1, 11]

Course-specific Institutional Learning Goals (ILG):

- Institutional Learning Goal 1. Written and Oral Communication in English.** Students will communicate effectively in both speech and writing.
- Institutional Learning Goal 2. Mathematics.** Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

Institutional Learning Goal 4. Technology. Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

Institutional Learning Goal 5. Social Science. Students will use social science theories and concepts to analyze human behavior and social and political institutions and to act as responsible citizens.

Institutional Learning Goal 10. Information Literacy: Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.

Institutional Learning Goal 11. Critical Thinking: Students will use critical thinking skills understand, analyze, or apply information or solve problems.

Units of study in detail – Unit Student Learning Outcomes:

Unit I [Data and Visualization Types] [Supports Course SLO #1]

Learning Objectives

The student will be able to:

- Analyze raw business and economic data and determine the data type
- Understand the concept of “Atomic data”
- Identify different data visualizations including types of charts, tables, and diagrams
- Determine which type of chart or visualization technique is appropriate for which kinds of data
- Create basic MS Excel visualizations including Bar Charts, Line Graphs, and Scatter Plots

Unit II [Introduction to Reports and Visualizations in MS Excel] [Supports Course SLOs #2 and #3]

Learning Objectives

The student will be able to:

- Access data in MS Excel and apply Excel’s filter to the data to create meaningful reports
- Using data in MS Excel, create charts of the appropriate form for a given data type
- Pull data from an Excel table using the VLOOKUP function
- Perform Excel functions on a data set such as SUM, AVERAGE, COUNT etc.
- Clean and prepare data for further analysis by eliminating missing data, editing data entry errors, correcting for data inconsistencies
- Use Excel’s Pivot Table tool to filter data and create report tables
- Use Excel’s Pivot Chart tool to create chart

Unit III [Advanced Charting with Excel] [Supports Course SLOs #4]

Learning Objectives

The student will be able to:

- Create a dual axis chart to show visuals depicting mixed data types
- Use Excel’s conditional formatting rules to highlight meaningful data
- Demonstrate relationships between variables using a trendline
- Construct more complex visuals including Stacked Charts, Histograms, and Box and Whisker Plots
- Understand the underlying structure of MS Excel charts so that the charts can be effectively edited and formatted

Unit IV [Dashboard Creation] [Supports Course SLOs #4, 5]

Learning Objectives

The student will be able to:

- Tell a meaningful story with a dashboard using a real-world data set
- Determine which data is relevant, which data is not, and what types of visualization would be appropriate for your dashboard

- Correct data discrepancies such as missing data, typos, and improperly formatted data
- Build a dashboard composed of multiple visualizations

Unit IV [Dashboard Presentation] [Supports Course SLOs #5, 6]

Learning Objectives

The student will be able to:

- Draw meaningful conclusions from the data and present those conclusions in a written summary
- Speak knowledgeably to a group about their dashboard and the information it is looking to convey while giving a presentation of the dashboard
- Respond to questions about the data and dashboard

Evaluation of student learning:

Students' achievement of the course objectives will be evaluated through the use of the following:

- Written exam at the completion of Unit I to assess the student's knowledge of data types and their correct use in visual displays
- Weekly graded homework assignments emphasizing the creation of visuals and reports in MS Excel during Units II, III, and IV
- Final written summary analysis and graded oral presentation of the students visualization dashboard