



**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.

<b>General Education Category:</b> <b>Not GenEd</b>	<b>Course coordinator:</b> 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