Miami Dade College

Course Description

CAP1760 | Introductions to Analytics | 4.00 credits

This course is designed for students who require or are interested in basic aspects of data mining and analytics using domain-specific data. Students learn the computerized techniques by which to organize, manipulate, report, present, depict and analyze domain-specific data in order to find or otherwise derive information. Prerequisites: CGS 1060C and use of a desktop database application, or equivalent experience.

Course Competencies:

Competency 1: The student will demonstrate a basic understanding of a desktop database application by:

1. Creating a new database
2. Defining Data Types that define the data being stored
3. Creating Tables in the design view
4. Adding and deleting records in a table
5. Creating and modifying a Form
6. Creating and modifying a Report

Competency 2: The student will demonstrate the ability to process and derive inherent information from a desktop database by:

1. Creating the three types of Lookups Listsin a table
2. Displaying related records in a sub- datasheet
3. Creating relationships between tables and enforcing referential integrity
4. Sorting and indexing records
5. Creating Simple queries
6. Creating Compound queries and using comparison operators
7. Creating Complex queries
8. Creating calculated values in a query

Competency 3: The student will demonstrate how to use basic computational and scientific features of desktop database applications by:

1. Developing and implementing numerical expressions, formulas, and conditional statements
2. Representing results in the appropriate data type and format
3. Creating, editing, and printing 2, 3, and 3-dimensional graphs and charts
4. Developing interactive functionality such as buttons, forms, menus, and switchboards

Competency 4: The student will obtain, interpret, store, and derive information from simple to moderately complex domain-specific datasets using a desktop database application by:

1. Accessing and downloading domain-specific data from public repositories
2. Interpreting the metadata
3. Creating and populating a database from the data and metadata interpretation
4. Using this database to develop and implement queries, join strategies, referential integrity rules
5. Developing interactive functionalities such as buttons, forms, menus, and switchboards
6. Outputting data and resultant queries as XML objects

Competency 5: The student will perform statistical and non-statistical data analysis on domain-specific data using a desktop database application by:

1. Applying each of the following statistical methods to the data: Average, Median, Mode, Max, Min Frequency Distribution Normal, and Binomial distribution Cluster Analysis Trend analysis using the least-squares method
2. Using ordering and roll-up techniques to summarize the data

3. Converting data into multidimensional information by Creating pivot tables and pivot web forms and Generating 2, 3, and n-dimensional graphs, charts, and pivot charts referencing the pivot tables and pivot web forms
4. Transforming the representation of the information into web-usable objects

Competency 6: The student will demonstrate the use and interpretation of basic analytics on the domain-specific information using a desktop database by:

1. Drilling down on pivot tables
2. Interpreting 2, 3, and n-dimensional graphs and charts
3. Creating and implementing what-if scenarios
4. Performing essential data mining
5. Creating a Form-based user interface to perform essential data mining dynamically

Competency 7: The student will derive new information that is not inherently modeled in the database by:

1. Performing and reporting on a capstone project that populates a database with publicly available disparate data, using inferential association of data across disparate tables, and creating symbolic n-dimensional representations of the data model
2. Utilizing the skills denoted in competencies 1-7 to accomplish Information Discovery, Discussing in written and oral form the relevance and degree of usefulness of the new information

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