BAKER COLLEGE
STUDENT LEARNING OUTCOMES

CS3950 Big Data Analytics
3 Semester Credit Hours

Student Learning Outcomes and Enabling Objectives

1. Demonstrate the use of Python architecture, supporting Integrated Development Environments (IDE), and applications.
   a. Examine Python and its environment.
   b. Investigate Python architecture.
   c. Install Python and supporting IDE.
   d. Demonstrate programming ability in the IDE Jupyter Notebook.

2. Demonstrate proficiency in importing and exporting data in Python.
   a. Manage data loading, storage, and file formats in Python.
   b. Download and analyze datasets from the internet.
   c. Develop Python scripts to import, export, and store data.

3. Demonstrate proficiency cleaning and preparing data in Python.
   a. Clean, transform, and reshape data.
   b. Identify and handle missing values.
   c. Understand how to format, normalize, and bin data.

4. Develop skills to summarize a data frame.
   a. Explore essential Python libraries for data analytics.
   b. Generate summary statistics with Pandas.
   c. Use the Numpy and Pandas for performing complex numerical analysis tasks.
   d. Produce high quality data visualizations using Matplotlib.

5. Perform statistical analyses on large data sets.
   a. Utilize Python for statistical data analysis.
   b. Articulate insights from the data through visualization and model testing.
   c. Develop ANOVA, linear regression, and multiple linear regression models in Python to generate findings.

d. Perform model evaluation, including over-fitting, under-fitting, model selection, and model refinement.
e. Implement Python to perform rich data analysis on a real-world project.

Big Ideas and Essential Questions

Big Ideas
- Building a "Big Data" culture.
- The importance of data fluency.
- Intelligence matters: Python as a data analytics tool.
- Big data analytics applied to real-world business challenges.

Essential Questions
1. What is "Big Data?"
2. Why is "data fluency" important?
3. Why is learning how to code in Python valuable to your career?
4. Why is big data analytics important to industry and government?
5. How will mastering this skillset help businesses solve complex challenges?

These SLOs are approved for experiential credit.

Effective: Fall 2021