University of Arkansas – Fort Smith
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General Syllabus

CS 1303 Introduction to Data Science

Credit Hours: 3 Lecture Hours: 3 Laboratory Hours: 0

Prerequisite: declared certification of proficiency in data analytics or consent of department head

Effective Catalog: 2018-2019

I. Course Information

A. Catalog Description

Introduces the topics of data science and machine learning. Explores the topics of data modeling and visualization, data wrangling, exploratory data analysis and statistical programming. Concepts of operating systems, data structures, algorithm design, and database systems are reviewed.

B. Additional Course Information

This course is used to satisfy the requirements for the Certificate of Proficiency in Data Analytics.

II. Student Learning Outcomes

A. Subject Matter

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

1. Develop operational knowledge of the field of data science and machine learning.
2. Develop operational knowledge of operating systems used in clustered environments.
3. Explain, design and apply algorithms/data structures to given problems.
4. Use statistical programming techniques.
5. Explain, design and apply knowledge of data wrangling.
6. Apply various data analysis techniques.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Communication Skills (written and oral)
Students will apply programming documentation, demonstrations and technical explanations to concepts and code execution.

Analytical Skills
Critical Thinking Skills - Students will analyze and design various solutions to satisfy class assignments. Students will measure effective solutions and accurate output in both programming and written solutions.

III. Major Course Topics

A. Data Science
B. Data Wrangling
C. Transforming and Mapping Data
D. Data Analysis
E. Descriptive Statistics
F. Inference
G. Sample Size
H. Hypothesis Testing
I. Algorithm Design
J. Design Optimization
K. Database Systems
L. Statistical Programming