University of Arkansas – Fort Smith
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General Syllabus
CS 2003 Data Structures

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

Prerequisite: CS 1024 Foundations of Programming II and MATH 2804 Calculus I or higher math

Effective Catalog: 2018-2019

I. Course Information

A. Catalog Description

Introduces the programming concepts of data structures and the algorithms derived from them. Topics include recursion, stacks, queues, linked lists, hash tables, trees, and graphs.

B. Additional Course Information

Fluency in a programming language is prerequisite to the study of most areas in the field of information technology and computer science. This course provides an introduction to various methods for storing and accessing data, which is essential for more complex and optimal programming.

II. Student Learning Outcomes

A. Subject Matter

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

1. Describe common applications for each data structure in the topic list.
2. Design and implement the user-defined data structures in a high-level language.
3. Create programs that use each of the following data structures: arrays, strings, linked lists, stacks, queues, trees, and hash tables.
4. Design, implement, test, and debug simple recursive functions and procedures.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking Skills: Students will identify and analyze a problem, break it down into its component parts and develop a solution using structured and object-oriented design methods with appropriate data structures.

Quantitative Reasoning: Students will learn to develop algorithms for solving problems involving formulas and numbers.

III. Major Course Topics

A. Data structures
B. Recursion
C. Stacks
D. Queues
E. Linked lists
F. Hash tables
G. Trees
H. Graphs