University of Arkansas – Fort Smith
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General Syllabus

CS 3003 Distributed Systems

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

Prerequisite: CS 2003 Data Structures

Effective Catalog: 2018-2019

I.   Course Information

A. Catalog Description
Design of distributed and integrative systems, including system architectures, development tools, inter-process communication, processes and threads, synchronization, design patterns and interfaces, data exchange and security.

B. Additional Course Information
Organizations typically use many disparate technologies that need to communicate and work together as a system. Many times, these software components are distributed among multiple computers on different networks and managed by different people. The importance and popularity of various types of distributed systems in business and industry continues to grow. This course addresses the various architectures and concepts, application programming interfaces and programming practices used to facilitate the design, development, management, integration and security of these systems.

II.   Student Learning Outcomes

A. Subject Matter
Upon successful completion of this course, the student will be able to:

1. Describe and contrast different architectures and patterns for creating distributed and integrative applications.
2. Describe and demonstrate the process of developing client-server applications using TCP/IP sockets and/or datagrams.
3. Describe and demonstrate the process of creating multi-threaded applications.

4. Describe and demonstrate how web services are used to integrate disparate applications in an organization and create distributed systems with computing resources from multiple management domains.
5. Explain the challenges of creating distributed applications related to communication, synchronization, naming, and security.

B. University Learning Outcomes
This course enhances student abilities in the following area:

Analytical Skills
Critical Thinking Skills: Students will identify a problem that requires distributed processes, break it down into its component parts and develop a solution.

III. Major Course Topics

A. Distributed System Architectures
B. Software Design Patterns
C. Inter-process Communications
D. Client-Server Computing
E. Peer-To-Peer Computing
F. Web Services
G. Processes and Threads
H. Synchronization
I. Consistency and Replication
J. Fault Tolerance
K. Security