University of Arkansas – Fort Smith
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General Syllabus

CS 3033 Computer Architecture

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

Prerequisite: CS 2003 Data Structures

Effective Catalog: 2018-2019

I.   Course Information

A. Catalog Description
Studies the organization and architecture of computer systems, beginning with the standard von Neumann model to current. Topics include digital logic, instruction set architecture, machine and assembly instructions, memory, and multiprocessors.

B. Additional Course Information
Differences in the internal structure and organization of a computer lead to significant differences in performance and functionality, giving rise to an extraordinary range of computing devices, from hand-held computers to large-scale, high-performance machines. This course addresses the various options involved in designing a computer system, the range of design considerations, and the trade-offs involved in the design process.

II.   Student Learning Outcomes

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

1. Outline the architectural features of a modern computer system.
2. Design digital logic circuits using the basic logic gates that implement features within a central processing unit and memory unit.
3. Explain the relationship between instruction set architecture, microarchitecture, and system architecture and their roles in the development of the computer.
4. Describe the concept of parallel processing and the relationship between parallelism and performance.

5. Design digital circuits and simulate their operation using simulation software

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

Analytical Skills
Critical Thinking Skills: Students will identify a digital logic circuit problem, break it down into its component parts and develop a solution.

III.   Major Course Topics

A. Digital logic and data representation
B. Computer architecture and organization
C. Interfacing and I/O strategies
D. Memory architecture
E. Simple microprogramming architecture
F. Functional organization and performance
G. Multiprocessing