



BAKER COLLEGE
STUDENT LEARNING OUTCOMES

CIS 3010 Computer Architecture
3 Semester Hours

Student Learning Outcomes and Enabling Objectives

1. Examine computer performance evolution
 - a. Present an overview of computer technology evolution including the evolution of the x86 architecture
 - b. Define embedded systems including requirements and constraints for various systems
 - c. Summarize key performance issues related to computer design
 - d. Distinguish between multicore, MIC, and GPGPU organizations
2. Explain computer function and interconnection
 - a. Describe the basic elements of an instruction cycle and the role of interrupts
 - b. Examine interconnection within a computer system and compare point-to-point and bus interconnections
 - c. Illustrate an overview of QPI and PCIe
3. Classify computer memory
 - a. Discuss the key elements of cache design and performance implications of cache design decisions
 - b. Describe internal memory and properties of contemporary DDR DRAM organizations
 - c. Present an overview of the newer nonvolatile solid-state memory technologies
 - d. Discuss external memory and compare and contrast hard disk drives and solid disk drives
4. Explain computer input/output
 - a. Discuss the use of I/O modules as part of computer organization
 - b. Identify programmed I/O and interrupt-driven I/O
 - c. Summarize the operation of direct memory access and direct cache access
5. Examine key functions of an operating system
 - a. Discuss the evolution of operating systems from early simple batch systems to modern complex systems
 - b. Explain techniques used for memory partitioning and assess the relative advantages of paging and segmentation
6. Explain number systems and computer arithmetic

- a. Discuss decimal, binary, and hexadecimal representations and techniques for converting between them
 - b. Explain twos complement representation and associated arithmetic operations
 - c. Describe floating-point numbers and the IEEE 754 standard for floating-point representation
 - d. Explain key concepts related to floating-point arithmetic, including guard bits, rounding, subnormal numbers, underflow and overflow
7. Examine digital logic
- a. Describe the basic operations of Boolean algebra
 - b. Distinguish among the different types of flip-flops
 - c. Use a Karnaugh map to simplify a Boolean expression
 - d. Present an overview of programmable logic devices

Big Ideas and Essential Questions

Big Ideas

- Computer structure and organization
- Role of different components of a computer
- Computer performance evolution
- Computer arithmetic
- Digital logic

Essential Questions

What are the main components of the computer organization and how do they work together to produce high performing computers?

How do computers perform basic operations?

These SLOs are approved for experiential credit.

Effective: Fall 2021