Computer Organization (2)

Course Name: Computer Organization (2)
Course Code: CAS303
Credit hours: 3
Knowledge Domain: Computer Architecture and System Software.
Prerequisite(s): Computer Organization (1) (CAS202)

Learning Objectives

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

1. Comprehend the detailed aspects of computer organization are considered such as: Arithmetic operations, microprogramming and RISC architectures, I/O and memory organization.
2. Identify the basic elements of multiprocessor architecture.

Learning Outcomes

1. Grasping the complete picture of computer organization by having reasonable details about its basic units.
2. Some knowledge about the basic features of multiprocessors including interprocessor communication and synchronization.

Overview and Syllabus

Computer arithmetic. Microprogrammed control. RISC architecture. I/O organization. Memory organization. Multiprocessors.

Course Outline

	Topic
1	**Module 01: Computer Arithmetic** Introduction Objectives **Lesson 01:** Addition and Subtraction **Lesson 02:** Implementation of Fast Adders **Lesson 03:** Multiplication and Division **Lesson 04:** Implementation of Fast Multipliers **Lesson 05:** Floating-Point Numbers and Operations Summary Assessment
2	**Module 02: Microprogrammed Control** Introduction Objectives

	Lesson 01: Control Memory **Lesson 02:** Address Sequencing and Execution **Lesson 03:** Microprogram Example **Lesson 04:** Design of Control Unit Summary Assessment
3	**Module 03: RISC Architecture** Introduction Objectives **Lesson 01:** Reduced Instruction Set Architecture **Lesson 02:** RISC Pipelining **Lesson 03:** Pipelining Hazards **Lesson 04:** RISC vs. CISC Summary Assessment
4	**Module 04: Input-Output Organization** Introduction Objectives **Lesson 01:** External Devices **Lesson 02:** Modes of I/O Transfer **Lesson 03:** Direct Memory Access **Lesson 04:** I/O Processor **Lesson 05:** Standard I/O Interfaces (PCI, SCSI, USB) Summary Assessment
5	**Module 05: Memory Organization** Introduction Objectives **Lesson 01:** Memory Hierarchy and Main Memory **Lesson 02:** Auxiliary Memory (Secondary Storage) **Lesson 03:** Associative Memory **Lesson 04:** Cache Memory **Lesson 05:** Virtual Memory Summary Assessment
6	**Module 06: Multiprocessors** Introduction Objectives **Lesson 01:** Interconnection Structures **Lesson 02:** Interprocess Arbitration, Communication, and Synchronization **Lesson 03:** Cache Coherence **Lesson 04:** Clusters **Lesson 05:** Multicore Computers Summary Assessment