Module Title:	Computer Architecture
Module ID:	CAP 223
Prerequisite:	CAP 221
Level:	4
Credit Hours:	3 (3+0+1)

Module Description:

This course focuses on the design of the CPU and computer system at the architectural (or functional) level: CPU instruction sets and functional units, data types, control unit design, interrupt handling and DMA, I/O support, memory hierarchy, virtual memory, and buses and bus timing. Introduction to digital systems: What constitutes a general-purpose computer; design of a minimal hardwired CPU. Assembly level machine organization: System buses, timing, arbitration, and bus protocol; the general fetch-execute cycle with interrupts; multiple bus systems. Memory system organization & architecture: Memory design and hierarchy; alignment; L1 and L2 caches; paging and virtual memory. Interfacing, communication External storage devices: magnetic and optical. Buffering of I/O, polling, interrupt-driven I/O, interrupt-driven I/O with DMA. Functional organization: integer and floating-point units, CPU instruction sets and addressing modes, RISC; CISC, long instruction word RISC processors, use of multiple functional units, pipelining.

Module Aims:

This course focuses on the design of the CPU and computer system at the architectural level.

Learning Outcomes:

- Understand all the basic concepts of information technology and its related terminologies.
- The ability to search through the Internet effectively.
- The ability to fully utilize an e/mail service

- Knowledge of e/learning and distance education systems and how they work and their benefits
- This course requires the student to demonstrate the following
- Apply the factors that contribute to computer performance
- Identify the characteristics of CISCS, RISC, and VLIW processors.
- Analyze multilevel caches systems
- Analyze the effect of memory and memory hierarchy on performance.
- Analyze Input/output systems.
- Identify the characteristics of multicore, multiprocessors, and clusters

Textbook:

William Stallings, Computer Organization and Architecture (6th edition)

Hennessy / Patterson, Computer Architecture: A Quantitative Approach