

CSE211:COMPUTER ORGANIZATION AND DESIGN

L:3 T:1 P:0 Credits:4

Course Outcomes: Through this course students should be able to

- review the structure and functioning of a digital computer and understand its overall system architecture.
- describe and understand the generic principles that underlie the building of a digital computer, digital logic and memory hierarchy
- analyze the working of memory unit and study the examples of mapping techniques for different cache memory systems
- understand functioning of the basic building blocks of a computer
- visualize the underlying architecture and connection of various hardware components of a computer
- develop innovative architectural designs of computers based on the common and fundamental concepts

Unit I

Basics Of Digital Electronics : Multiplexers and De multiplexers, Decoder and Encoder, Registers., Logic gates, Flip flops, binary counters, Introduction to combinational circuit, introduction to sequential circuits

Register Transfer and Micro Operations : Register Transfer Language and Register Transfer, Logic Micro Operations, Shift Micro Operations, register transfer, arithmetic microoperations

Unit II

Computer Organization : instruction codes, computer registers, common bus system, computer instructions, timing and control, instruction cycle, memory reference instructions, input-output and interrupt

Unit III

Central Processing Unit : General Register Organization, Data Transfer and Manipulation, Program control, Addressing Modes, Reduced instruction set computer, Complex instruction set computer

Unit IV

Input-Output Organization : Input Output Interface, Priority interrupt, Data transfer schemes, Direct memory access transfer, Input/Output processor., modes of data transfer

Unit V

Memory hierarchy : main memory, auxiliary memory, associative memory, cache memory, virtual memory

Unit VI

Introduction to Parallel Processing : Pipelining, Characteristics of multiprocessors, Interconnection Structures, parallel processing

Latest technology and trends in computer architecture : multi-cores processor., next generation processors architecture, microarchitecture, latest processor for smartphone or tablet and desktop

Multiprocessors : Categorization of multiprocessors(SISD,MIMD,SIMD.SPMD), Introduction to GPU

Text Books:

1. COMPUTER SYSTEM ARCHITECTURE by MORRIS MANO, PRENTICE HALL

References:

1. COMPUTER ARCHITECTURE A QUANTITATIVE APPROACH by HENNESSY,J.L,DAVID A PATTERSON, AND GOLDBERG, PEARSON
2. COMPUTER ORGANIZATION AND ARCHITECTURE-DESIGNING FOR PERFORMANCE by WILLIAM STALLINGS, PRENTICE HALL