

# CSE211:COMPUTER ORGANIZATION AND DESIGN

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

**Course Outcomes:** Through this course students should be able to

- CO1 :: recognize the need and understanding of basic building blocks of digital circuits
- CO2 :: discuss about the usability of various functional components of a digital computer
- CO3 :: apply the knowledge of building blocks to get more insights about the working operations of various functional components of digital system
- CO4 :: categorize the different types of transfer schemes and analyze the process of direct memory access
- CO5 :: illustrate and getting more insights about the interconnection structure of memory
- CO6 :: define pipelining and provide the technical insights about the latest trends of computer architecture

## Unit I

**Basics Of Digital Electronics** : registers, shift registers, Introduction to combinational circuit, introduction to sequential circuits

**Register Transfer and Micro Operations** : Bus and Memory Transfer, Logic Micro Operations, Shift Micro Operations, register transfer language, register transfer, arithmetic logic shift unit

## 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, Stack Organization, Addressing Modes, Reduced instruction set computer, Complex instruction set computer, instruction formats

## Unit IV

**Input-Output Organization** : Peripheral Devices, Input Output Interface, Data Transfer Schemes, Program Control and Interrupts, Direct Memory Access Transfer and Input/Output Processor, Priority interrupt, Direct memory access transfer, Input/Output processor., modes of data transfer, Processor status word

## Unit V

**Memory Unit** : Memory Hierarchy and Processor Vs Memory Speed, Associative Memory, Memory Management, Memory hierarchy, Cache memory, Virtual memory, main memory, auxiliary memory

## Unit VI

**Computer Arithmetic** : Addition and Subtraction Algorithm, Multiplication Algorithm

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

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

**Text Books:** 1. COMPUTER SYSTEM ARCHITECTURE by M. MORRIS MANO, RAJIB MALL, PEARSON

**References:** 1. COMPUTER ORGANIZATION AND ARCHITECTURE by WILLIAM STALLINGS, PEARSON

