**CSE/T/ 215A Computer Organization**

**Fundamentals of Computers**

Introduction to Digital Computers Hardware and Software & their dual nature, Von-Neumann Concept, Role of Operating System and Compiler

**[1L]**



**Instruction Set [4L]**

Opcode and operand, Instruction formats, Addressing modes and effective address calculation, Instruction decoding and Instruction execution cycle

**Arithmetic Unit [8L]**

ANSI representation of data, Signed addition and subtraction, Fast addition, carry-look-ahead adders and carry save adders, Different multiplication techniques for signed numbers, Booth’s Technique including Bit-pair technique, Binary division techniques. Restoring type and Non-restoring type

Floating point arithmetic and different rounding techniques

**Memory Organization [8L]**

Memory Hierarchy and different access techniques, Main memory and Secondary memory concepts, Memory Interleaving, S-access and C-access organization, Cache Memory, Different mapping techniques and Replacement Algorithms, Virtual memory and implementation using Page map table

**Control Unit Design [8L]**

Instruction interpretation and execution, Hardwired control design, Micro-programmed control design, Instruction format design and nano-programming

**Input Output Organization [7L]**

I/O interface and drivers, Programmed I/O, Synchronous and Asynchronous I/O transfer Interrupt driven I/O transfer, Direct Memory Access (DMA), I/O processor

**Pipeline Processing [4L]**

**Suggested Readings:**

1. Computer Organization , Hamacher et.al.
2. Computer Architecture & Organization , J.P. Hayes
3. Computer System Architecture, Morris Mano
4. Computer Organization & Design, P.Pal Chaudhuri
5. Computer Organization and Architecture, William Stallings