# IT9201 COMPUTER ORGANIZATION

LTPC
3 1 04

## AIM:
To understand the basics of digital design, the design of various components of the computer system and its organization.

## OBJECTIVES:
- To understand the fundamentals of Boolean logic and functions.
- To design and realize these functions with basic gates, and other components using combinational and sequential logic.
- To understand the design and organization of a von-neumann computer system.
- To comprehend the importance of the hardware-software interface.

## UNIT I  DIGITAL FUNDAMENTALS  9 +3
Number systems and conversions – Boolean algebra and simplification – Minimization of Boolean functions – Karnaugh map – Quine McCluskey tabulation method – Logic gates – NAND – NOR implementation.

## UNIT II  COMBINATIONAL AND SEQUENTIAL CIRCUITS  9+3
Design of combinational circuits – Adder / Subtracter – Encoder – Decoder – Mux / Demux – Comparators – Flip Flops – Triggering – Master – Slave Flip Flop – State diagrams and minimization – Counters – Registers.

## UNIT III  BASIC STRUCTURE OF COMPUTERS  9+3
Functional units – Basic operational concepts – Bus structures – Performance and metrics – Instructions and instruction sequencing – Hardware – Software Interface – Instruction set architecture – Addressing modes – RISC – CISC.  ALU design – Fixed point and floating point operations.

## UNIT IV  PROCESSOR DESIGN  9 +3
Fundamental concepts – Execution of a complete instruction – Hardwired control – Micro programmed control. Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and control considerations – Performance considerations

## UNIT V  MEMORY AND I/O SYSTEMS  9 +3
Memory Technology – Memory hierarchy – Cache Memory – Design Methods – Virtual Memory – Input/Output System – Programmed I/O – DMA and Interrupts – Functions of I/O devices and interfaces.

L: 45, T: 15, TOTAL= 60 PERIODS

## TEXT BOOKS:
1. Morris Mano, "Digital Design", Third Edition, Pearson Education, 2002.
2. Carl Hamacher, Zvonko Vranesic And Safwat Zaky, "Computer Organization", Fifth Edition,Tata McGraw Hill, 2002.