

**III Semester**  
**Course 7: Computer Organization**  
Credits -3

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**Course Objectives**

To familiarize with organizational aspects of memory, processor and I/O.

**Course Outcomes**

Upon successful completion of the course, the students will be able to

1. Identify different types of instructions
2. Differentiate between micro-programmed and hard-wired control units.
3. Analyse the performance of hierarchical organization of memory.
4. Summarize different data transfer techniques.
5. Demonstrate arithmetic operations on fixed- and floating-point numbers and illustrate concepts of parallel processing.

**UNIT – I**

**Register Transfer Language and Micro Operations:** Introduction- Functional units, computer registers, register transfer language, register transfer, bus and memory transfers, arithmetic, logic and shift micro-operations, arithmetic logic shift unit.

**Basic Computer Organization and Design:** Instruction codes, instruction cycle.

Register reference instructions, Memory – reference instructions, input – output and interrupt.

**UNIT – II**

**CPU and Micro Programmed Control:** Central Processing unit: Introduction, instruction formats, addressing modes. Control memory, address sequencing, design of control unit - hard wired control, micro programmed control.

**UNIT – III**

**Memory Organization:** Memory hierarchy, main memory, auxiliary memory, associative memory, cache Memory and mappings.

**UNIT – IV**

**Input-Output Organization:** Peripheral Devices, input-output interface, asynchronous data transfer, modes of transfer- programmed I/O, priority interrupt, direct memory access, Input – Output Processor (IOP).

**UNIT – V**

**Computer Arithmetic and Parallel Processing:** Data representation- fixed point, floating point, addition and subtraction, multiplication and division algorithms.

Parallel Processing-Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline.

**Text Books:**

1. M. Moris Mano, “Computer Systems Architecture”, 3rd edition, Pearson/ PHI.

**Reference Books:**

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