MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR

(A Govt. Aided UGC Autonomous &NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Department of Engineering Mathematics and Computing

B. Tech. (Second Semester)

Computer system Organization and Logic Design

(MAC- 250201)

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Course Objectives:

- Discuss the basic concepts and structure of computers.
- Understand concepts of register transfer logic and arithmetic operations.
- Explain different types of addressing modes and memory organization.
- Learn the different types of serial communication techniques.
- Summarize the Instruction execution stages.

Unit 1:

Introduction, Milestones in Computer Architecture, Von Neumann Model: Processor Organization- ALU, Control Unit; System Bus, Memory, I/O Devices. Multilevel model of Computer.

Unit 2:

Representation of numbers, integer and floating-point representation, 1's complement, 2's complement, character codes (ASCII, EBCDIC), Boolean Algebra

Unit 3:

Memory Organization: Memory Hierarchy, Memory Properties, Main Memory, Associative Memory, Cache Memory. Machine Language Level (ISA level): Instruction Formats, Addressing Modes, Instruction Types, Flow of Control. RISC v/s CISC.

Unit 4:

Memory mapped I/O and I/O mapped I/O, I/O Techniques: Programmed I/O, Concept of Interrupts, Interrupt driven I/O and DMA, I/O Device Interfaces, I/O Processors, Serial and Parallel Communication, Computer Buses.

Unit 5:

Parallel Architectures: On-chip Parallelism- Instruction Level Parallelism, Onchip Multithreading, Multicore Processor Architecture. Pipelining: RISC Pipeline, Exception handling of Pipelining, Hazards of Pipelining.

Course Outcomes

After completing this course, the students will be able to:

CO's	Description of CO's
CO1	Understand the theory and architecture of central processing unit.
CO2	Define different number systems, binary addition and subtraction, 2's complement representation and operations with this representation
CO3	Use appropriate tools to design verify and test the CPU architecture.
CO4	Learn the concepts of parallel processing, pipelining and inter processor communication.
CO5	Exemplify in a better way the I/O and memory organization

Recommended Books

1. William Stallings: Computer Organization and Architecture, Sixth Edition, PHI, 3rd Ed, 2011
2. Sivaraama Dandamudi: Fundamentals of Computer organization and design, Springer, 2nd Ed. , 2012
3. Andrew S Tanenbaum: Structured Computer Organization, Fourth Edition PHI, 4th Ed, 2014