

IV B.Tech – I Semester
(17CS743) COMPUTER ARCHITECTURE & ORGANISATION
(Open Elective-I)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	1	-	3

Pre-Requisites: Computer Networks, Microprocessors & Microcontrollers

Course Objectives:

- Understand the architecture of a modern computer with its various processing units. Also the Performance measurement of the computer system.
- In addition to this the memory management system of computer.

UNIT- I

Basic Structure Of Computers: Functional unit, Basic Operational concepts, Bus structures, System Software, Performance, The history of computer development.

UNIT- II

Machine Instruction and Programs: Instruction and Instruction Sequencing: Register Transfer Notation, Assembly Language Notation, Basic Instruction Types, Addressing Modes, Basic Input/output Operations, The role of Stacks and Queues in computer programming equation. Component of Instructions: Logic Instructions, shift and Rotate Instructions

UNIT- III

Type of Instructions: Arithmetic and Logic Instructions, Branch Instructions, Addressing Modes, Input/output Operations

UNIT- IV

INPUT/OUTPUT ORGANIZATION: Accessing I/O Devices, Interrupts: InterruptHardware, Enabling and Disabling Interrupts, Handling Multiple Devices, Direct Memory Access, Buses: Synchronous Bus, Asynchronous Bus, Interface Circuits, Standard I/O Interface: Peripheral Component Interconnect (PCI) Bus, Universal Serial Bus (USB)

UNIT- V

The MEMORY SYSTEMS: Basic memory circuits, Memory System Consideration, Read Only Memory: ROM, PROM, EPROM, EEPROM, Flash Memory, Cache Memories: Mapping Functions, INTERLEAVING Secondary Storage: Magnetic Hard Disks, Optical Disks

UNIT- VI

Processing Unit: Fundamental Concepts: Register Transfers, Performing An Arithmetic Or Logic Operation, Fetching A Word From Memory, Execution of Complete Instruction, Hardwired Control, Micro programmed Control: Microinstructions, Micro program Sequencing, Wide Branch Addressing Microinstructions with next –Address Field.

Course Outcomes:

After successful completion of the course, the students can be able to:

S. No	Course Outcome	BTL
1.	Understand the architecture of modern computer and data representation	L2
2.	Demonstrate the programming proficiency using the various data transfer instructions of the target computer.	L4
3.	Understand different instruction formats, addressing modes & microprogrammed control	L2
4.	Analyze arithmetic operation of positive and negative numbers	L4
5.	Demonstrate how cache mapping occurs in a computer and can solve various related problems	L4
6.	Understand the circuitry to the processor I/O ports in order to interface the processor to the external devices	L2

Correlation of COs with POs & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	-	2	1	-	2	-	-	-	-	-	-	1	2	-
CO 2	-	2	1	-	2	-	-	-	-	-	-	1	2	-
CO 3	-	2	1	-	2	-	-	-	-	-	-	1	2	-
CO 4	-	2	1	-	2	-	-	-	-	-	-	1	2	-
CO 5	-	2	1	-	3	-	-	-	-	-	-	1	2	-
CO 6	-	2	1	-	2	-	-	-	-	-	-	1	2	-

TEXT BOOKS:

1. Computer Organization, Carl Hamacher, Zvonks Vranesic, Safea Zaky, 5th Edition, McGraw Hill.
2. Computer Architecture and Organization, John P. Hayes, 3rd Edition, McGraw Hill.

REFERENCE BOOKS:

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI
2. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson
3. Fundamentals of Computer Organization and Design, - Sivarama Dandamudi SpringerInt. Edition.
4. “Computer Organization and Design: The Hardware/Software Interface” by David A. Patterson and John L. Hennessy.
5. J.P. Hayes, "Computer Architecture and Organization", McGraw-Hill, 1998.