

Program : Diploma in Computer Engineering	
Course Code : 3131	Course Title: Computer Organisation
Semester : 3	Credits: 4
Course Category: Program Core	
Periods per week: 4 (L:4 T:0 P:0)	Periods per semester: 60

Course Objectives:

- Visualize the basic building blocks of a computer.
- Understand the memory hierarchy and technology, different ways of communicating with the I/O and interfaces.
- Familiarise the functional units and working of a processor unit.
- Provide knowledge on latest processor technologies.

Course Prerequisites:

Topic	Course code	Course name	Semester
Various Computer Hardware Components, ports/interfaces and related cables		Introduction to IT systems Lab	I

Course Outcomes :

On completion of the course, the student will be able to:

CO _n	Description	Duration (Hours)	Cognitive Level
CO1	Illustrate the basic operational concepts and memory of a computer system	16	Understanding
CO2	Explain the Input / Output organisation of a Computer System	15	Understanding
CO3	Illustrate the working of Processing Unit of a Computer System	14	Understanding
CO4	Illustrate the working of Microprocessors	12	Understanding
	Series Test	3	

CO – PO Mapping

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2						
CO2	2						
CO3	2						
CO4	2						

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	Illustrate the basic operational concepts and memory of a computer system.		
M1.01	Describe various functional units of a Computer system.	1	Understanding
M1.02	Illustrate the basic operational concepts of a computer system.	1	Understanding
M1.03	Explain the bus structure	1	Understanding
M1.04	Explain the connection of memory to the processor.	1	Understanding
M1.05	Summarize the features of various semiconductor memories	3	Understanding
M1.06	Outline the memory hierarchy with respect to speed, size and cost.	2	Understanding
M1.07	Infer the effective memory access time of cache memory	2	Understanding
M1.08	Explain the concept of virtual memory	2	Understanding
M1.09	Summarize the features of various secondary storage devices	3	Understanding
Contents:			
Computer System - Functional units - Basic operational concepts - Connection of the memory to the processor -Bus Structure -Semiconductor RAM Memories - Organisation of bit cells in a memory chip.			
Static memory (General features only) - Synchronous DRAM, Asynchronous DRAM, Double data rate SDRAM.			

Read Only Memory (General features only) - ROM, PROM, EPROM, EEPROM, Flash Memory.

Memory Hierarchy (basic concept only) - Cache Memory (basic concept only) - Virtual Memory (basic concept only).

Secondary Storage (General features only) - Magnetic Hard Disks - RAID - Optical Disks.

CO2	Explain the Input / Output organisation of a Computer System		
M2.01	Outline I/O interfacing with memory mapped I/O and Program controlled I/O.	3	Understanding
M2.02	Illustrate the working of interrupts in accessing I/O devices.	3	Understanding
M2.03	Demonstrate Direct Memory Access as an I/O mechanism for high speed devices.	3	Understanding
M2.04	Outline the features of Standard Interfaces	3	Understanding
M2.05	Summarize the features of computer peripherals	3	Understanding
	Series Test – I	1.5	

Contents:

Input/Output Organisation - Accessing of I/O devices - Memory mapped I/O, Program controlled I/O, Interrupts - Interrupt hardware, Handling Multiple Interrupts - Direct Memory Access (basic concept only)

Standard I/O interfaces (General features only) - PCI, SCSI, USB

Computer Peripherals (General features only) - Input Devices - Keyboard, Mouse, Scanner - Output Devices - Video Displays, Flat Panel Displays, Printers, Graphics Accelerators.

CO3	Illustrate the working of Processing Unit of a Computer System		
M3.01	Explain the internal functional units of a processor	2	Understanding
M3.02	Illustrate the Execution of an instruction.	6	Understanding
M3.03	Illustrate the various methods to generate control signals	4	Understanding
M3.04	Outline the principle of Pipelining	2	Understanding

Contents:

Processing Unit : Fundamental Concepts - Register Transfers, Performing Arithmetic and Logic Operations, Fetching a word from Memory, Storing a word in Memory - Execution of a Complete Instruction, Branch Instructions - Hardwired Control - Complete Processor - Microprogrammed Control - Pipelining .

CO4	Illustrate the working of Microprocessors		
M4.01	Summarize the history of Microprocessors	1	Understanding
M4.02	Illustrate the architecture 8086/8088 Microprocessor.	5	Understanding
M4.03	Outline architecture of a Pentium Processor	3	Understanding
M4.04	Outline the features of Multicore Processors	3	Understanding
	Series Test – II	1.5	

Contents:

Basic x86 Architecture - Role of Microprocessor in Micro Computer – Brief history of Microprocessors (with specific insight into x86 family - Features of 8086 -Internal Block Diagram of 8086 – Execution Unit – Bus Interface Unit – General Architecture of a Pentium Processor - Multi core Processor

Text / Reference:

T/R	Author /Book Title
T1	Carl Hamachar, Computer Organization , McGraw Hill, 5 th ed.
T2	Lyla B Das, The x86 Microprocessors- Architecture, Programming and Interfacing , Pearson
R1	William Stallings, Computer Organization and Architecture , Pearson Education , 8 th ed.
R2	Morris Mano, Computer System Architecture , Prentice Hall of India- 2002
R3	John Hayes, Computer Architecture and Organization ,McGraw Hill-1998
R4	Sunil Mathur, Microprocessor 8086 Architecture, Programming and Interfacing , PHI,2011

Online Resources

Sl.No	Website Link
1	https://nptel.ac.in/courses/106108100/
2	www.tutorialsspace.com/Computer-Architecture-And-Organization