COMPUTER ORGANIZATION	
CSE 212	**Credits : 3**
Instruction **:** 3 Periods & 3Extended Tut/Week	Sessional Marks : 40
End Exam : 3 Hours	End Exam Marks : 60

Prerequisites:

- Digital Logic Design

Course Objectives:

- To understand the basics of computer hardware and how software interacts with computer hardware.
- To understand the structure, function and characteristics of computer systems.
- To understand the basic structure and operation of digital computer.
- To study the design of arithmetic and logic unit.
- To study the two types of control unit techniques and the concept of pipelining.
- To understand the hierarchical memory system including cache memories and virtual memory.
- To understand the different ways of communicating with I/O devices and standard I/O interfaces.

Course Outcomes:

the end of the course, the student will be able to:	
1.	Identify the basic principles and apply to arithmetic for ALU implementation.
2.	Examine the functional aspects of processor unit.
3.	Compare and assess the working principles of hardwired and microprogrammed control
4.	Inspect addressing modes, instruction formats in various CPU organizations and Assess the performance implications of processing techniques.
5.	Infer the design issues in memory and I/O organizations.

Mapping of Course Outcomes with Program Outcomes:

Mapping		PO												PSO	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO	1	3	2	2	1					1	1		1	1	1
	2	2	2	2	1									1	2
	3	1	3	2	3									1	1
	4	2	2	2	2									1	2
	5	2	3	3	3					1	1		1	2	2

SYLLABUS

UNIT-1 **12Hours** **Register Transfer and Micro operations :**

Register Transfer Language, Bus and Memory Transfers, Arithmetic, Logic and Shift Micro operations, Arithmetic Logic Shift Unit,

Computer Arithmetic:

Introduction, Addition and Subtraction, Booth Multiplication, Division & Decimal Arithmetic Unit Hardware Implementation & Algorithms.

Learning Outcomes:

1. Identify the basic principles of a computer & its Memory Transfers.

2. Apply Arithmetic operations for ALU Implementation.

UNIT-2 **10 Hours**

Basic Computer Organization Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Input-Output and Interrupt, Complete Computer Description.

Learning Outcomes:

1. Analyze the computer Instruction, Instruction codes, Instruction Cycle.
2. Examine the procedure of an Instruction Cycle.

UNIT-3 **9Hours**

Control Design:

Hardwired & Micro Programmed (Control Unit), Control Memory, Address Sequencing, Conditional and Unconditional Branching, Micro program Example.

Learning Outcomes:

1. Specify the design of a control unit in a computer.
2. Distinguish between Hardwired & Micro programmed control unit.

UNIT-4 **12Hours**

Central Processing Unit:

Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes with numerical examples, Data Transfer and Manipulation, Program Control, Program Interrupt, Types of interrupts, CISC Characteristics, RISC Characteristics.

Introduction to Parallel Processing, Pipelining – General Considerations.

Learning Outcomes:

1. Examine addressing modes, Instruction formats in various CPU Organizations.
2. Analyze the Data processing operations of CPU.

UNIT-5 **17Hours**

Input-Output Organization:

Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access.

Memory Organization:

Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory.

Learning Outcomes:

1. Deduce the design issues of Input-output organization.
2. Conclude the Design issues in memory organization of a computer.

TEXT BOOK

1. M.Morris Mano, “Computer System Architecture”, Pearson Education Inc., 2003, Third Edition.

REFERENCE BOOKS

1. William Stallings, Computer Organization and Architecture, 6th Edition, Pearson/PHI, 2007.
2. Andrew S. Tanenbaum, Structured Computer Organization, 5th Edition, PHI/Pearson, 2007.

ONLINE WEB RESOURCES

1. https://nptel.ac.in/courses/106/103/106103068/
2. https://freevideolectures.com/course/2277/computer-organization

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