Computer Organization and Architecture

Course Code	23EC4501D	**Year**	III	**Semester**	I
Course Category	PE-I	**Branch**	ECE	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Pre requisites**	-
Continuous Internal Evaluation	30	**Semester End Evaluation**	70	**Total Marks**	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		BL
CO1	Understand the representation of data, the register transfer language and Micro operations.	L2
CO2	Know the basic computer organization and design, programming the basic computer and design the micro programmer control unit.	L3
CO3	Know the development of central processing unit and explain various algorithms for computer arithmetic operations.	L3
CO4	Interface various Peripheral devices and various data transfer operations.	L4
CO5	Study the memory Hierarchy and different types of memories.	L2

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of Correlations (3:High, 2:Medium, 1:Low)

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
CO1	2								2		2	3	
CO2	3								2		2	3	
CO3	3								2		2	3	
CO4	3	3							2		2	3	
CO5	2								2		2	3	
Avg.	3	3							2		2	3	

Syllabus		
Unit No.	**Contents**	**Mapped CO**
1	**Introduction:** Digital Computers, Von Neumann computers, Basic organization of a computer, Data Representation: Data types, Complements, Fixed-point representation, Conversion of fractions, Floating-point representation. **Register Transfer and Micro operations:** Register transfer language, Register transfer, Bus and Memory transfers, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations, Arithmetic Logic Shift Unit.	CO1, CO2
2	**Basic Computer Organization and Design:** Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference instructions, Input-Output and Interrupt, Complete Computer Description, Design of Basic computer **Micro programmed Control:** Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.	CO2, CO3

3	**Central Processing Unit:** Introduction, General Register Organization, Stack organization, Instruction Formats, Addressin g Modes, Data transfer and Manipulation, Program Control, Reduced Instruction Set Computer **Computer Arithmetic**: Introduction, Addition and Subtraction, Multiplication Algorithms, Division Algorithms, Floating-Point Arithmetic Operations, Decimal Arithmetic Unit, Decimal Arithmetic Operations.	CO2, CO3
4	**Input-Output organization :**Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA), Input-Output Processor (IOP), Serial Communication.	CO4
5	**Memory Organization:** Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware.	CO5

Learning Resources
Text Books
1. M.Morris Mano, "Computer System Architecture," 3rd Ed., Pearson Publishers, Revised
Reference Books
1. William Stallings Computer Organization and Architecture- designing for performance, 8th Ed., Prentice Hall, New Jersy,2010,. 2. John P Hayes, "Computer Architecture and Organization", 3rd Ed.,Mc-Graw Hill Publishers,
e-Resources & other Digital Material
1. https://onlinecourses.nptel.ac.in/noc25_cs154/preview 2. https://www.youtube.com/playlist?list=PLBlnK6fEyqRgLLlzdgiTUKULKJPYc0A4q 3. https://study.madeeasy.in/subjects/what-is-computer-organization-and-architecture/ 4. https://www.geeksforgeeks.org/computer-organization-von-neumann-architecture/