Department : Computer Science and Engineering	
Course Title : Computer Organization and Architecture	*Course Code : CS410*
Credits(L:T:P) : 4:0:0	*Core/Elective : Core*
Type of Course : Lecture	*Total Contact Hours : 52*
CIE Marks : 50	*SEE Marks : 100*

Course outcomes: After completing this course, students should be able to:

CO1	Comprehend and analyze the basic structure, operation of computers and the perspective of Computer architect.
CO2	Deduce the communication of processor with I/O devices
CO3	Design and evaluate the performance of memory systems.
CO4	Analyze and design Arithmetic Logic Unit.
CO5	Design of processor and understanding basic concepts of Pipelining.

Unit No.	Course Content	No. of Hours

1.	**Basic Structures of Computers, Machine Instructions & Programs:** computer Types, Functional units, Basic Operational Concepts, Bus Structures, Performance. **Machine Instructions and Programs:** Numbers, Arithmetic operations and characters, Memory Location and Addresses, Memory Operations, Instructions and Instruction Sequencing, Addressing Modes, Assembly Language, Stacks and Queues, Subroutines, Additional Instructions, Encoding of machine instructions.	12
2.	**Input /Output Organization:** Basic Input output Operations, Accessing I/O Devices, Interrupts, Direct Memory Access, Buses, Interface Circuits.	08
3	**The Memory System:** Basic Concepts, Semiconductor RAM Memories, Read Only Memories, Speed, Size, and Cost, Cache Memories, Virtual Memories.	08
4.	**Arithmetic Operations:** Addition and Subtraction of Signed Numbers, Design of Fast Adders, Multiplication of Positive Numbers, Signed Operand Multiplication, Integer Division, Floating-point Numbers and Operations.	12
5.	**Basic Processing Unit and Pipelining:** Some Fundamental Concepts, Execution of a Complete Instruction, Multiple Bus Organization, Hard-wired Control, Micro-programmed Control. **Pipelining**- Basic Concept—The Ideal Case, Pipeline Organization, Pipelining Issues.	12

Text Books:

1. Computer Organization – Carl V Hamacher, ZvonkoVranesic, 6th Edition, McGraw Hill, 2012.
2. Structured Computer Organization – Andrew S. Tanenbaum, Todd Austin, 4th Edition PHI / Pearson, 2017.

Reference Books:

1. Computer Systems Architecture – M. MorisMano, 3rd Edition, Pearson/PHI, 2007.
2. Hennessey and Patterson, ―Computer Architecture A Quantitative Approach‖, 4th

Edition, Elsevier, 2007.

3. V Heuring & H Jordan, Computer System Design& Architecture, Addison Wesley, 1stt Edition, 1999.

Web Resources:

1. https://nptel.ac.in/courses/106106092/
2. https://nptel.ac.in/noc/individual_course.php?id=noc17-cs35