DEPARTMENT CORE COURSE-8 (DCC)
EC208- COMPUTER ARCHITECTURE

Details of Course:

Course Title	Course Structure			Pre-Requisite
	L	**T**	**P**	
Computer Architecture	3	0	2	Digital Electronics

Course Objective:
To introduce fundamentals concepts of computer architecture.

Course Outcomes (CO):
1. Explain computer architecture, types of instructions, addressing modes, modes of data transfer, types of memories and pipelining.
2. Demonstrate ALU, arithmetic algorithms, pipelining and parallel processing.
3. Organize different types of CPUs, memories and input output devices.
4. Design ALU, hardwired control unit, microprogrammed control unit, system memory and basic computer system.
5. Simulate ALU Design, array multiplier, multiplication algorithms (shift & add and Booth's) and memory.

S. No.	Content	Contact Hours
Unit 1	Register Transfer and Microoperation: Register Transfer Language, Register Transfer, Bus and Memory Transfer, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations, Design of ALU.	4
Unit 2	Computer Organization and Design: Instruction Codes, Computer Registers, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Timing & Control, Instruction Cycle, Memory Reference Instructions, Input-Output and Interrupt related instruction cycle, Design of Hardwired and Microprogrammed Control Unit, Microprogramming.	12
Unit 3	Input – Output Organization: Peripheral devices, Input – Output interface, Asynchronous Data Transfer, Modes of Data Transfer, Priority Interrupt, Direct Memory Access, Input – Output Processor.	5
Unit 4	Memory: Memory hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware.	5
Unit 5	Computer Arithmetic: Introduction, Addition and Subtraction, Multiplication Algorithms, Division Algorithms, Floating Point Arithmetic Operation, Decimal Arithmetic Unit, Decimal Arithmetic Operations. Hardware implementation of arithmetic algorithms.	11
Unit 6	Introduction to RISC, Parallel Processing, Concept of Pipelining, Arithmetic Pipelining, Instruction Pipelining, Vector Processing, Array Processors.	5
TOTAL		42

Books:

S. No.	Name of Books/ Authors/ Publisher
1	M. Morris Mano, "Computer System Architecture", PHI, 3rd Edition, 1992
2	J. P. Hayes, "Computer Architecture and Organization", Tata McGraw Hill, 3rd Edition, 2002
3	William Stallings, "Computer Organization and Architecture", Pearson Education India, Ninth Edition, 2013, 9th edition
4	D. A. Patterson and J. L. Hennessy, "Computer Organization and Design", Morgan Kaufmann, Elsevier, 5th edition, 2014
5	A. S. Tannenbaum and T. Austin, "Structured Computer Organization", Pearson, Sixth Edition, 2013, 6th edition