



C.U.SHAH UNIVERSITY – WADHWANCITY

FACULTY OF TECHNOLOGY AND ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

B. TECH. SEMESTER: - IV

SUBJECT NAME: - Computer Organization and Architecture(COA) SUBJECT CODE: - 4TE04COA1

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical			Total
							Sessional Exam		University Exam		Internal		University	
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
4TE04COA1	Computer Organization and Architecture(COA)	3	0	2	5	4	30	1.5	70	3.0	30	20	-	150

Objectives:

- The main objective is to introduce the main concepts and components of computer organization and architecture.

Prerequisites:

- Basic concepts of computer system and Digital Logic Design.

Course outline:

Sr. No.	Course Contents	Total Hours
1	INTRODUCTION: Computer system, Memory, Register, Micro-processor, Computer organization, Computer Architecture.	04
2	OVERVIEW OF REGISTER TRANSFER AND MICROOPERATIONS: Register Transfer Language, Register transfer, Bus and Memory transfer, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic Logic Shift Unit.	06
3	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, Design of Accumulator Unit.	08
4	PROGRAMMING THE BASIC COMPUTER: Introduction, Machine Language, Assembly Language, The Assembler, Program loops, Programming Arithmetic and logic operations, Subroutines, I/O Programming.	06
5	MICROPROGRAMMED CONTROL: Control Memory, Address sequencing, Micro-program Example, design of control Unit	04

6	CENTRAL PROCESSING UNIT: Introduction, General Register Organization, Stack Organization, Instruction format, Addressing Modes, data transfer and manipulation, Program Control, Reduced Instruction Set Computer (RISC)	06
7	PIPELINE AND VECTOR PROCESSING: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors	06
8	COMPUTER ARITHMETIC: Introduction, Addition and subtraction, Multiplication Algorithms, Division Algorithms, Floating Point Arithmetic Operations, Decimal Arithmetic Unit and Decimal Arithmetic Operations	06

Learning Outcomes:

Students will have thorough knowledge about :

- Basic structure of a digital computer.
- Arithmetic operations of binary number system.
- The organization of the Control unit, Arithmetic and Logical unit, Memory unit and the I/O unit.

Books Recommended:

1. Computer System Architecture: By **M. Morris Mano**, Pearson Prentice Hall, 3RD Edition,2007.
2. Computer organization and architecture by **william stallings** , Pearson Prentice Hall, 8th edition,2008.
3. Structured Computer Organization by **Andrew S. Tanenbaum, Todd M. Austin**, Pearson Prentice Hall,2012.
4. Computer Architecture and Organization by **John P. Hayes**, Tata Mc-Graw Hill,3RD Edition,1998.