CAP208:COMPUTER ORGANIZATION AND DESIGN

L:4 T:0 P:0 Credits:4

Course Outcomes: Through this course students should be able to

- identify the factors influencing the design of hardware and software elements of computer system
- evaluate the various processor components and their interconnection
- analyze the types of instructions and interrupts in computer system

Unit I

Register Transfer and Microoperations : Register Transfer Language, Register Transfer, Bus and Memory Transfer, Arithmetic Microoperations, Logic microoperations, Shift Microoperations, Number System, Compliments, Fixed point and floating point representation, Half Adder and Full Adder

Unit II

Instruction Codes and Instruction Cycle : Instruction codes, Common Bus System, Timing and control, Instruction Cycle, Types of instructions

Unit III

Machine Language and Programming : Introduction of Machine Language, Assembly Language Basics, Assembler Basics, program loops, Arithmetic and Logic Operation programming, Subroutines, Input-Output programming, Programming loops

Unit IV

Central Processing Unit : General Register Organization, Addressing Modes, Reverse Polish Notation, Three address Instructions, One Address Instructions, RISC Instructions, Zero Address Instructions, Two Address Instructions, Organization of stacks

Unit V

Pipeline processing : Instruction and arithmetic pipeline, Pipeline hazards and their resolution, Parallel processing

Unit VI

Memory technology : Cache memory and memory hierarchy, Virtual memory and memory management unit, Memory hierarchy, Associative memory, Cache memory

I/O subsystems : Input-output devices, Interfacing with IO devices, Concept of handshaking, DMA data transfer, Asynchronous data transfer

Text Books:

1. COMPUTER SYSTEM ARCHITECTURE by MORRIS MANO, PEARSON

References:

1. COMPUTER ORGANIZATION AND ARCHITECTURE by V RAJARAMAN, PRENTICE HALL

2. COMPUTER ARCHITECTURE A QUANTITATIVE APPROACH by DAVID A PATTERSON, PRENTICE HALL

3. COMPUTER ORGANIZATION AND ARCHITECTURE: DESIGNING AND PERFORMANCE by WILLIAM STALLINGS, PEARSON

4. COMPUTER ORGANIZATION by V. CARL HAMACHER, SAFWAT G. ZAKY AND ZVONKO G. VRANESIC, MCGRAW HILL EDUCATION