JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF COMPUTER APPLICATIONS

Course Code	COMPUTER ORGANIZATION & ARCHITECTURE	L	T	P	C
21F00103		4	0	0	4
	Semester	I			

Course Objectives:

- Learn the fundamentals of computer organization and its relevance to classical and modern problems of computer design
- Understand the structure and behavior of various functional modules of a computer.
- Discuss the techniques that computers use to communicate with I/O devices
- Study the concepts of pipelining and the way it can speed up processing.
- Describe the basic characteristics of multiprocessors

Course Outcomes (CO): Student will be able to

- Demonstrate computer architecture concepts related to design of modern processors, memories and I/Os
- Able to explore the hardware requirements for cache memory and virtual memory
- Ability to design algorithms to exploit pipelining and multiprocessors
- Ability to use memory and I/O devices effectively
- Detect pipeline hazards and identify possible solutions to those hazards

UNIT – I Lecture Hrs:

Basic Structure of Computer: Computer Types, Functional Units, Basic operational Concepts, Bus Structure, Software, Performance, Multiprocessors and Multicomputer.
Machine Instructions and Programs: Numbers, Arithmetic Operations and Programs, Instructions and Instruction Sequencing, Addressing Modes, Basic Input/output Operations
INTEL-8086: CPU architecture, Addressing modes - generation of physical address - code segment registers, Zero, one, two, and three address instructions, INTEL 8086 ASSEMBLY LANGUAGE INSTRUCTIONS-Data transfer instructions, input - output instructions, arithmetic, logical shift, and rotate instructions, Conditional and unconditional transfer.

UNIT – II Lecture Hrs:

Arithmetic: Addition and Subtraction of Signed Numbers, Design of Fast Adders, Multiplication of Positive Numbers, Signed-operand Multiplication, Fast Multiplication, Integer Division, Floating- Point Numbers and Operations.
Basic Processing Unit: Fundamental Concepts, Execution of a Complete Instruction, Multiple-Bus Organization, Hardwired Control, Multi-programmed Control.

UNIT - III Lecture Hrs:

The Memory System: Basic Concepts, Semiconductor RAM Memories, Read-Only Memories, Speed, Size and Cost, Cache Memories, Performance Considerations, Virtual Memories, Memory Management Requirements, Secondary Storage.

UNIT – IV Lecture Hrs:

Input/output Organization: Accessing I/O Devices, Interrupts, Processor Examples, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces.

UNIT – V

Pipelining: Basic Concepts, Data Hazards, Instruction Hazards, Influence on Instruction Sets.
Large Computer Systems: Forms of Parallel Processing, Array Processors, The Structure of General-Purpose multiprocessors, Interconnection Networks.

TEXT BOOKS:

1. Computer Organization, Carl Hamacher, ZvonkoVranesic, SafwatZaky, McGraw Hill Education, 5th Edition, 2013.
2. Microprocessors and Interfacing, Douglas Hall, Tata McGraw-Hill.

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