COURSE TITLE	**:**	**COMPUTER ARCHITECTURE**
COURSE CODE	**:**	**3131**
COURSE CATEGORY	**:**	**B**
PERIODS/WEEK	**:**	**4**
PERIODS/SEMESTER	**:**	**60**
CREDITS	**:**	**4**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Computer Function and Internal Memory	**15**
2	External Memory and Input/Ouptut	**15**
3	Processor Structure	**15**
4	Control Unit Organization	**15**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	**1**	To understand Von Neumann Machine
	2	To know Computer Memory Systemmplement Branch, Call and time delay
2	**1**	To understand External Memory
	2	To understand I/O Devices
3	**1**	To understand Processor Structure and Functions
4	1	To understand Control Unit Organization
	2	To know Parallel Processing

Specific Outcomes:

MODULE –I Computer Function and Internal Memory

1.1 To understand Von Neumann Machine

1.1.1 To describe Von Neumann Machine

1.1.2 To explain various Computer functions

1.1.3 To describe Interconnection structures

1.1.4 To describe Bus Interconnection

1.2 To know Computer Memory System

1.2.1 To list Cache Memory Principles

1.2.2 To explain Semiconductor Main Memory

1.2.3 To List Advanced DRAM types

MODULE – II External Memory and Input/Output

2.1 To understand External Memory

2.1.1 To Describe the organization of Magnetic Disk

2.1.2 To list and describe RAID

2.1.3 To explain Optical Memory

2.2 To understand I/O Devices

2.2.1 Toexplain different external Devises

2.2.2 To describe I/O Modules – Programmed IO, Interrupt Driven IO, DMA

MODULE – III Processor Structure

3.1 To understand Processor Structure and Functions

3.1.1 To describe Processor organization

3.1.2 To illustrate Register organization

3.1.3 To explain Instruction Cycle

3.1.3 To explain Instruction Pipelining

MODULE –IV Control Unit Organization

4.1 To understand Control Unit Organization

4.1.1 To describe Micro operations

4.1.2 To explain the control of the Processor

4.1.3 To explain the Hardwired implementation

4.1.4 To describe Micro programmed control

4.2 To know Parallel Processing

4.2.1 To explain Parallel processing

4.2.2 To describe Multiple processor organization

CONTENT DETAILS

MODULE –I Computer Function and Internal Memory

The Von Neumann Machine – Computer Components - Computer functions – Instruction Fetch and Execute – Interrupts – I/O Function- Interconnection structures - Bus Interconnection – Bus Structure –Multiple Bus Hierarchies –Elements of Bus Design

Characteristics of Memory System –The Memory Hierarchy - Cache Memory Principles - Elements of Cache Design -- Semiconductor Main Memory – Organization –DRAM and SRAM –Types of ROM - Advanced DRAM types- synchronous DRAM – Rambus DRAM – DDR SDRAM – Cache DRAM

MODULE – II External Memory and Input/Output

Magnetic Disk - Magnetic Read and Write Mechanism – Data Organization and formatting – Physical Characteristics – RAID – Level 0,1,2,3,4,5,6 - Optical Memory – Compact Disk – Digital Versatile Disk – High Definition Optical Disks

External Devices – Keyboard /Monitor – Disk Drive -- I/O Modules – Module function – I/O Module Structure - Programmed IO, Interrupt Driven IO, DMA

MODULE – III Processor Structure

Processor organization - Register organization – User visible Registers – Control and Status Registers - Instruction Cycle –The Indirect Cycle – Data Flow - Instruction Pipelining

MODULE –IV Control Unit Organization

Micro operations – Fetch Cycle – Indirect Cycle - Interrupt Cycle – Execute Cycle – Instruction Cycle - Control of the Processor - Hardwired implementation - Micro programmed control

Parallel processing - Multiple processor organization

Text Book(s)

1. Computer Organization and Architecture– William Stallings Pearson Education , Eighth Edition

References:

1. Computer Organization - Carl Hamachar- Mc Graw Hill, fifth edition.
2. Computer Architecture and Organization-John Hayes- Mc Graw Hill-1998.
3. Computer System Architecture -Morris Mano- Prentice Hallof India- 2002.,

Web Site

http://nptel.ac.in/course :s/Webcourse-contents/IIT-%20Guwahati/comp_org_arc/web/