COMPUTER ORGANIZATION

Course code: 18IS3DCCOG **Credits: 03**
L: P: T: S: 3: 0: 0: 0 **CIE Marks: 50**
Exam Hours: 03 **SEE Marks: 50**
Total Hours: 40

Course Objectives:

1. To learn and understand about the fundamental concepts of how Computer Systems works & its basic principles.
2. To learn and understand I/O device address, Interrupts and different buses.
3. To learn and understand the current state of art in memory system design.
4. To impart knowledge on arithmetic concepts of signed numbers, Adders Design, Multiplication and floating point numbers.

Course Outcomes: After completion of the course, the graduates will be able to

CO1	**Interpret** the concepts of working of Computer Systems and its basic principles.
CO2	**Illustrate** the concepts of interrupts and exceptions.
CO3	**Illustrate** the various types of standard input output interfaces buses.
CO4	**Explain** the function of each element of a memory hierarchy.
CO5	**Analyze** Performance issues in Processor and Memory Design of a Digital Computer.
CO6	**Solving** problems on addition and subtraction of signed numbers and multiplication of positive numbers.

Mapping of Course outcomes to Program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	3	2	1	-	-	-	-	-	-	-	-	-	1	-	-
CO3	3	2	1	-	-	-	-	-	-	-	-	-	-	2	-
CO4	3	2	2	-	-	-	-	-	-	-	-	-	1	-	-
CO5	3	2	1	-	-	-	-	-	-	-	-	-	-	2	-
CO6	2	2	1	-	-	-	-	-	-	-	-	-	-	2	-

Unit	Course Content	Hours	COs
1	**Basic Structure of Computers:** Functional Units, Basic Operational Concepts, Performance – Basic Performance Equation, Clock Rate, Performance Measurement. **Machine Instructions and Programs:** Numbers, Arithmetic Operations and Characters, Memory Location and Addresses.	08	CO1
2	**Input/output Organization:** Accessing I/O Devices, Interrupts – Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, Controlling Device Requests, Exceptions	08	CO1, CO2
3	**Input/output Organization cntd :** Direct Memory Access, Buses, Standard I/O Interfaces – PCI Bus, SCSI Bus, USB-Port Limitations, Plug-And-Play, USB Architecture, Addressing, and USB protocols.	08	CO2, CO3
4	**Memory System:** Basic Concepts, Semiconductor RAM Memories, Speed, Size and Cost, Cache Memories – Mapping Functions, Performance Considerations-Interleaving, Hit Rate and Miss Penalty; Virtual Memories.	08	CO4, CO5
5	**Arithmetic:** Addition and Subtraction of Signed Numbers, Design of Fast Adders, Multiplication of Positive Numbers, Signed Operand Multiplication, Fast Multiplication-Bit-Pair Recoding of Multipliers, Integer Division, Floating-point Numbers and Operations-IEEE Standard for Floating-point Numbers.	08	CO6

Self study component:

Note:

1. Questions for CIE and SEE not to be set from self-study component.

2. Assignment Questions should be from self-study component only.

UNIT – 1: Computer Types, Historical Perspective, Memory Operations, Instructions and Instruction Sequencing, processor clock.

UNIT – 2: Addressing Modes, Assembly Language, Basic Input and Output operation

UNIT – 3: Interface circuits.

UNIT – 4: Read Only Memories, Replacement Algorithms, Secondary Storage

UNIT – 5: Arithmetic: Fast multiplication -Carry-Save Addition of Summands

Basic Processing Unit: Single bus organization, Execution of a Complete Instruction, Multiple Bus Organization, Hard-wired Control, and Micro programmed Control.

TEXT BOOKS

1. Carl Hamacher, ZvonkoVranesic, SafwatZaky: Computer Organization, 5th Edition, Tata McGraw Hill, 2002.

(Listed topics only from Chapters 1, 2, 4, 5, 6)

REFERENCE BOOKS

1. William Stallings: Computer Organization & Architecture, 7th Edition, PHI, 2006.

2. Computer Systems Design and Architecture by Vincent P. Heuring& Harry F.Jordan, Ed2, Pearson Education, 2004.

Assessment Pattern:

CIE –Continuous Internal Evaluation Theory (50 Marks)

Bloom's Category	**Tests**	**Assignments**	**AAT1**	**AAT2**
Marks (Out of 50)	**30**	**10**	**05**	**05**
Remember	10			01
Understand	10	05	01	01
Apply	10	05	02	01
Analyze			02	
Evaluate				
Create				02

***AAT 1– Alternate Assessment Tool 1:**
AAT 2 - Alternate Assessment Tool 2:

SEE –Semester End Examination Theory (50 Marks)

Bloom's Category	**Marks Theory(50)**
Remember	05
Understand	10
Apply	10
Analyze	10
Evaluate	10

Create	05