

COMPUTER ORGANIZATION (Effective from the academic year 2018 -2019) SEMESTER – III			
Course Code	18CS34	CIE Marks	40
Number of Contact Hours/Week	3:0:0	SEE Marks	60
Total Number of Contact Hours	40	Exam Hours	03
CREDITS –3			
Course Learning Objectives: This course (18CS34) will enable students to: <ul style="list-style-type: none"> • Explain the basic sub systems of a computer, their organization, structure and operation. • Illustrate the concept of programs as sequences of machine instructions. • Demonstrate different ways of communicating with I/O devices and standard I/O interfaces. • Describe memory hierarchy and concept of virtual memory. • Describe arithmetic and logical operations with integer and floating-point operands. • Illustrate organization of a simple processor, pipelined processor and other computing systems. 			
Module 1			Contact Hours
Basic Structure of Computers: Basic Operational Concepts, Bus Structures, Performance – Processor Clock, Basic Performance Equation, Clock Rate, Performance Measurement. Machine Instructions and Programs: Memory Location and Addresses, Memory Operations, Instructions and Instruction Sequencing, Addressing Modes, Assembly Language, Basic Input and Output Operations, Stacks and Queues, Subroutines, Additional Instructions, Encoding of Machine Instructions Text book 1: Chapter1 – 1.3, 1.4, 1.6 (1.6.1-1.6.4, 1.6.7), Chapter2 – 2.2 to 2.10 RBT: L1, L2, L3			08
Module 2			
Input/Output Organization: Accessing I/O Devices, Interrupts – Interrupt Hardware, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces – PCI Bus, SCSI Bus, USB. Text book 1: Chapter4 – 4.1, 4.2, 4.4, 4.5, 4.6, 4.7 RBT: L1, L2, L3			08
Module 3			
Memory System: Basic Concepts, Semiconductor RAM Memories, Read Only Memories, Speed, Size, and Cost, Cache Memories – Mapping Functions, Replacement Algorithms, Performance Considerations. Text book 1: Chapter5 – 5.1 to 5.4, 5.5 (5.5.1, 5.5.2), 5.6 RBT: L1, L2, L3			08
Module 4			
Arithmetic: Numbers, Arithmetic Operations and Characters, Addition and Subtraction of Signed Numbers, Design of Fast Adders, Multiplication of Positive Numbers, Signed Operand Multiplication, Fast Multiplication, Integer Division. Text book 1: Chapter2-2.1, Chapter6 – 6.1 to 6.6 RBT: L1, L2, L3			08
Module 5			
Basic Processing Unit: Some Fundamental Concepts, Execution of a Complete Instruction, Multiple Bus Organization, Hard-wired Control, Micro programmed Control. Pipelining: Basic concepts of pipelining, Text book 1: Chapter7, Chapter8 – 8.1 RBT: L1, L2, L3			08
Course Outcomes: The student will be able to : <ul style="list-style-type: none"> • Explain the basic organization of a computer system. 			

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| <ul style="list-style-type: none">• Demonstrate functioning of different sub systems, such as processor, Input/output, and memory.• Illustrate hardwired control and micro programmed control, pipelining, embedded and other computing systems.• Design and analyse simple arithmetic and logical units. |
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Question Paper Pattern:

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| <ul style="list-style-type: none">• The question paper will have ten questions.• Each full Question consisting of 20 marks• There will be 2 full questions (with a maximum of four sub questions) from each module.• Each full question will have sub questions covering all the topics under a module.• The students will have to answer 5 full questions, selecting one full question from each module. |
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Textbooks:

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| <ol style="list-style-type: none">1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Computer Organization, 5th Edition, Tata McGraw Hill, 2002. (Listed topics only from Chapters 1, 2, 4, 5, 6, 7, 8, 9 and 12) |
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Reference Books:

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| <ol style="list-style-type: none">1. William Stallings: Computer Organization & Architecture, 9th Edition, Pearson, 2015. |
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