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| **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: | | | | |
| * 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 : | | | | |
| * Explain the basic organization of a computer system. | | | | |

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| * 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. |
| **Question Paper Pattern:** |
| * 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. |
| **Textbooks:** |
| 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 and12) |
| **Reference Books:** |
| 1. William Stallings: Computer Organization & Architecture, 9th Edition, Pearson, 2015. |