

COMPUTER ORGANIZATION [As per Choice Based Credit System (CBCS) scheme] (Effective from the academic year 2015 -2016) SEMESTER - III			
Subject Code	15CS34	IA Marks	20
Number of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	50	Exam Hours	03
CREDITS – 04			
Course objectives: This course will enable students to <ul style="list-style-type: none"> • Understand the basics of computer organization: structure and operation of computers and their peripherals. • Understand the concepts of programs as sequences or machine instructions. • Expose different ways of communicating with I/O devices and standard I/O interfaces. • Describe hierarchical memory systems including cache memories and virtual memory. • Describe arithmetic and logical operations with integer and floating-point operands. • Understand basic processing unit and organization of simple processor, concept of pipelining and other large computing systems. 			
Module -1			Teaching 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 Textbook 1: Ch 1: 1.3, 1.4, 1.6.1, 1.6.2, 1.6.4, 1.6.7. Ch 2: 2.2 to 2.10, 2.12			10Hours
Module -2			
Input/Output Organization: Accessing I/O Devices, Interrupts – Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, Controlling Device Requests, Exceptions, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces – PCI Bus, SCSI Bus, USB. Textbook 1: Ch 4: 4.1, 4.2: 4.2.1 to 4.2.5, 4.4 to 4.7.			10 Hours
Module – 3			
Memory System: Basic Concepts, Semiconductor RAM Memories, Read Only Memories, Speed, Size, and Cost, Cache Memories – Mapping Functions, Replacement Algorithms, Performance Considerations, Virtual Memories, Secondary Storage. Textbook 1: Ch 5: 5.1 to 5.4, 5.5.1, 5.5.2, 5.6, 5.7, 5.9			10 Hours
Module-4			

<p>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, Floating-point Numbers and Operations.</p> <p>Textbook 1: Ch 2: 2.1, Ch 6: 6.1 to 6.7</p>	<p>10 Hours</p>
<p>Module-5</p>	
<p>Basic Processing Unit: Some Fundamental Concepts, Execution of a Complete Instruction, Multiple Bus Organization, Hard-wired Control, Micro programmed Control. Embedded Systems and Large Computer Systems: Examples of Embedded Systems, Processor chips for embedded applications, Simple Microcontroller. The structure of General-Purpose Multiprocessors.</p> <p>Textbook 1: Ch 7: 7.1 to 7.5, Ch 9:9.1 to 9.3, Ch 12:12.3</p>	<p>10 Hours</p>
<p>Course outcomes:</p>	
<p>After studying this course, students will be able to:</p> <ul style="list-style-type: none"> • Acquire knowledge of <ul style="list-style-type: none"> - The basic structure of computers & machine instructions and programs, Addressing Modes, Assembly Language, Stacks, Queues and Subroutines. - Input/output Organization such as accessing I/O Devices, Interrupts. - Memory system basic Concepts, Semiconductor RAM Memories, Static memories, Asynchronous DRAMS, Read Only Memories, Cache Memories and Virtual Memories. - Some Fundamental Concepts of Basic Processing Unit, Execution of a Complete Instruction, Multiple Bus Organization, Hardwired Control and Micro programmed Control. - Pipelining, embedded and large computing system architecture. • Analyse and design arithmetic and logical units. • Apply the knowledge gained in the design of Computer. • Design and evaluate performance of memory systems • Understand the importance of life-long learning 	
<p>Graduate Attributes (as per NBA)</p> <ol style="list-style-type: none"> 1. Engineering Knowledge 2. Problem Analysis 3. Life-Long Learning 	
<p>Question paper pattern:</p> <p>The question paper will have ten questions. There will be 2 questions from each module. Each question will have questions covering all the topics under a module. The students will have to answer 5 full questions, selecting one full question from each module.</p>	
<p>Text Books:</p> <ol style="list-style-type: none"> 1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky: Computer Organization, 5th Edition, Tata McGraw Hill, 2002. 	
<p>Reference Books:</p> <ol style="list-style-type: none"> 1. William Stallings: Computer Organization & Architecture, 9th Edition, Pearson, 2015. 	

Scanned
H. O. D.