

SCHEME OF COURSE WORK

Course Details:

Course Title	: COMPUTER ORGANIZATION			
Course Code	: 13CT1105	L T P C	4 0 0 3	
Program:	: B.Tech.			
Specialization:	: Information Technology			
Semester	: III Sem			
Prerequisites	: INTRODUCTION TO COMPUTERS SCIENCE AND INFORMATION			
Courses to which it is a prerequisite	: EMBEDDED SYSTEMS-1			

Course Outcomes (COs):

1	Discuss basic structure and organization of computers.
2	Explain register transfer micro operations.
3	Apply fixed and floating point arithmetic algorithms.
4	Discuss memory and input/output organizations.
5	Explain pipeline and vector processing.

Program Outcomes (POs):

A graduate of Information Technology will be able to

1	Ability to apply the knowledge of mathematics, science, engineering fundamentals and principles of Information Technology to solve problems in different domains.
2	Ability to analyze a problem, identify and formulate the computing requirements appropriate to its solution.
3	Ability to design & develop software applications that meet the desired specifications within the realistic constraints to serve the needs of the society.
4	Ability to design and conduct experiments, as well as to analyze and interpret data
5	Ability to use appropriate techniques & tools to solve engineering problems.
6	Ability to apply the knowledge to analyze and understand societal, health, safety, legal, and cultural issues relevant to the Information Technology practices.
7	Ability to analyze the local and global impact of computing on individual as well as on society.
8	Ability to demonstrate professional ethical practices and social responsibilities in global and societal contexts.
9	Ability to function effectively as an individual, and as a member or leader in diverse and multidisciplinary teams.
10	Ability to communicate effectively with the engineering community and with society at large.
11	Ability to understand engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects.
12	Ability to recognize the need for updating the knowledge in the chosen field and imbibing learning to learn skills.

Course Outcome versus Program Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	S	M	S	S	S	M			S	M	M	M
CO-2	S	M	S	S	S	M			S	M	M	M
CO-3	S	M	S	S	S	M						M
CO-4	S	M	S	S	S	M						M
CO-5	S	M	S	S	S	M						M

S - Strongly correlated, *M* - Moderately correlated, *Blank* - No correlation

Assessment Methods:	Assignment / Quiz / Mid-Test / End Exam
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Teaching-Learning and Evaluation

Week	TOPIC / CONTENTS	Course Outcomes	Sample questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	Computer Components, Computer Function, Bus Interconnection, Processor Organization, Register Organization.	CO-1	1. Describe the functionalities of computer components? 2. Discuss Processor and Register organization.	<ul style="list-style-type: none"> ▫ Lecture ▫ Demonstration 	Assignment 1
2	Instruction codes, Computer instructions, Memory reference instructions, Instruction Cycle.	CO-1	1. Classify Computer instructions. 2. Draw the functionality diagram of Instruction cycle.	<ul style="list-style-type: none"> ▫ Lecture ▫ Demonstration 	Quiz 1
3	Stack organization, instruction formats, addressing modes, data transfer and manipulation, program control, RISC.	CO-1	1. Convert the following infix expression into zero/ one/ two/ three address formats. 2. Differentiate between CISC & RISC	<ul style="list-style-type: none"> ▫ Lecture ▫ Problem solving 	Quiz 1
4	Register transfer language, Register transfer, Bus and Memory transfers, Arithmetic Micro operations,	CO-2	1. Represent Register, Bus and memory transfer using RTL Notation and their corresponding timing diagrams. 2. Draw the Combinational Circuit of Full Adder/Subtractor	<ul style="list-style-type: none"> ▫ Lecture ▫ Demonstration 	Quiz 1
5	Logic Micro operations, Shift Micro operations, Arithmetic Logic Shift Unit.	CO-2	1. List Logic Micro operations. 2. List Shift Micro operations	<ul style="list-style-type: none"> ▫ Lecture ▫ Demonstration 	Assignment 1
6	Control Memory, Address Sequencing, Micro Program examples, Design of control unit, Hardwired control.	CO-2	1. Explain branching instructions. 2. Design the circuit diagram of control unit.	<ul style="list-style-type: none"> ▫ Lecture ▫ Demonstration 	Assignment 1
7	Data representation- Fixed point representation, Floating point representation, Addition and Subtraction,	CO-3	1. Represent the various forms of data representation with examples 2. Perform Addition and subtraction of two numbers by considering sample data.	<ul style="list-style-type: none"> ▫ Lecture ▫ Problem solving 	Quiz 1
8	Multiplication Algorithms, Division Algorithms,	CO-3	1. Draw the flowchart of Multiplication algorithm 2. Perform multiplication and division of two numbers by considering sample data.	<ul style="list-style-type: none"> ▫ Lecture ▫ Problem solving 	Assignment 1
9	MID TEST - 1				
10	Floating-point Representations, Floating-point Arithmetic Operations, Decimal Arithmetic Units, Decimal Arithmetic Operations.	CO-3	1(a). Express 32_{10} in the revised 14-bit floating-point model. (b). Express -26.625_{10} in the revised 14-bit floating-point model. 2. List decimal arithmetic operations.	<ul style="list-style-type: none"> ▫ Lecture ▫ Discussion ▫ Problem solving 	Quiz 2
11	Memory system overview, Memory Hierarchy, Semi-conductor Main	CO-4	1. Explain memory hierarchy. 2. Discuss about cache memory.	<ul style="list-style-type: none"> ▫ Lecture ▫ Discussion 	Assignment 2

	Memory, Cache Memory principle, Elements of cache design,				
12	Virtual Memory, Magnetic Disk, Optical Memory, Magnetic Tape, RAID.	CO-4	1. Explain virtual memory. 2.Explain the RAID levels	▫ Lecture ▫ Discussion	Quiz 2
13	External Devices, I/O modules, Interrupts, Programmed I/O, Interrupt driven I/O, Direct Memory Access, I/O Channels and Processors, PCI.	CO-4	1.Draw the flow diagram of interrupted I/O 2. Explain about DMA.	▫ Lecture ▫ Discussion	Quiz 2
14	Asynchronous Data Transfer, Priority Interrupt, Serial Communication.	CO-4	1. Differentiate between synchronous and asynchronous data transfer. 2. Explain serial communication	▫ Lecture	Quiz 2
15	Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.	CO-5	1.List the advantages of parallel processing 2. Explain vector processing.	▫ Lecture	Assignment2
16	Multiprocessors and Multi computers, Characteristics of Multi-processors, Multiple Processor Organizations,	CO-5	1. Differentiate between multi processor and multi computer. 2. Explain the characteristics of multiprocessor.	▫ Lecture	Assignment2
17	Symmetric Multi-Processors, Cache Coherence, Clusters, Non Uniform Memory Access (NUMA).	CO-5	1. Explain the taxonomy of parallel processor. 2.Explain the organization of NUMA	▫ Lecture	Assignment2
18	Mid-Test 2				
19/20	END EXAM				