

### Computer Organization and Architecture

<b>Course Code</b>	20CS3303	<b>Year</b>	II	<b>Semester</b>	I
<b>Course Category</b>	PCC3	<b>Branch</b>	CSE	<b>Course Type</b>	Theory
<b>Credits</b>	3	<b>L-T-P</b>	3-0-0	<b>Prerequisites</b>	-
<b>Continuous Internal Evaluation :</b>	30	<b>Semester End Evaluation:</b>	70	<b>Total Marks:</b>	100

#### Course Outcomes

Upon successful completion of the course, the student will be able to

<b>CO1</b>	Understand the basic functional units of a computer system and its organization.	<b>L2</b>
<b>CO2</b>	Apply appropriate instructions for processing various types of computer operations.	<b>L3</b>
<b>CO3</b>	Apply various types of organizations on registers.	<b>L3</b>
<b>CO4</b>	Analyze memory hierarchy, I/O communication and pipelining.	<b>L4</b>

#### Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO1</b>	√													
<b>CO2</b>									√	√			√	
<b>CO3</b>									√	√			√	
<b>CO4</b>		√							√	√				

<b>Syllabus</b>		
<b>Unit No</b>	<b>Contents</b>	<b>Mapped CO</b>
<b>I</b>	<b>Register Transfer and Micro-Operations:</b> Register Transfer Language, Register Transfer, memory Transfers, Bus construction with Multiplexers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic Logic Shift Unit.	<b>CO1,CO2</b>
<b>II</b>	<b>Basic Computer Organization:</b> Instruction codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Input- Output and Interrupt.	<b>CO1,CO2</b>
<b>III</b>	<b>Central Processing Unit:</b> General registers Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control.	<b>CO1,CO3</b>
<b>IV</b>	<b>Computer Arithmetic:</b> Introduction, Addition and Subtraction, Booth Multiplication Algorithm. <b>Memory Organization:</b> Memory Hierarchy, Main Memory, Auxiliary memory, Associative Memory, Cache Memory, Virtual Memory.	<b>CO1,CO2, CO4</b>
<b>V</b>	<b>Input-Output Organization:</b> Peripheral Devices, Input-output Interface, Asynchronous Data Transfer, Priority Interrupt, Direct Memory Access (DMA), Input-Output Processor. <b>Pipeline and Parallel Processing:</b> Parallel processing, Pipelining, Arithmetic pipeline, Instruction pipeline.	<b>CO1,CO4</b>

### Learning Resources

#### Text Books

1. Computer System Architecture, Morris M. Mano, Third Edition, 1992, Pearson.

#### References

1. Computer Organization and Architecture, William Stallings, Eighth Edition, 2010, PHI.
2. Computer Organization, Carl Hamachar, Vranesic, 2002, McGraw Hill.

#### e- Resources and other Digital Material

1. <https://nptel.ac.in/courses/106/106/106106092/>