COURSE TITLE	Computer Organization
COURSE CODE	CC-201
COURSE CREDIT	3
Session Per Week	4
Total Teaching Hours	40 HOURS

AIM

To study and understand the basic organization of computers and the working of each component.

LEARNING OUTCOMES

On the completion of the course students will:

1. Understand the working of basic computer components and CPU operation.
2. Data Representation in computers.
3. Understand the concepts related to computer memory.

DETAIL SYLLABUS

UNIT	TOPIC / SUB TOPIC	TEACHING HOURS
	Logic Circuits and Components of Digital Computers	10
1	**Digital Logic Circuit** • Digital Computers • Logic Gates • Boolean Algebra	2

	• Combinational Circuits
	   o Half-Adder
	   o Full-Adder
		2

	• Flip-Flops
	   o SR Flip-Flop
	   o D Flip-Flop
	   o JK Flip-Flop
	   o T Flip-Flop
		2

	Digital Components
	• Integrated Circuits
	• Decoders
	   o NAND Gate Decoder
	   o Encoders
		2

	• Multiplexers
	• Registers
	• Shift Registers
	• Binary Counters
	• Memory Unit
	   o Random-Access Memory
	   o Read-Only Memory
	   o Types of ROMs
		2

		Representation of Data and Register Transfer with Microoperations	10
2		**Data Representation** • Data Types o Number System o Octal and Hexadecimal Numbers o Decimal Representation o Alphanumeric Representation • Complements o (r-1)'s Complement o (r)'s Complement	1
		• Fixed-Point Representation o Integer Representation o Arithmetic Addition o Arithmetic Subtraction o Overflow o Decimal Fixed-Point Representation • Floating-Point Representation • Error Detection Codes	2
		Register Transfer and Micro-operations • Register Transfer Language • Register Transfer • Bus and Memory Transfers o Three-State Bus Buffers o Memory Transfer	1
		• Arithmetic Micro-operations o Binary Adder o Binary Adder-Subtractor o Binary Incrementer o Arithmetic Circuit	3
		• Logic Micro-operations o List of Logic Micro-operations o Hardware Implementation • Shift Micro-operations • Arithmetic Logic Shift Unit	3
3		**Design and Organization of Basic Computer, CPU**	10
		Basic Computer Organization and Design • Instruction Codes o Stored Program Organization o Indirect Address • Computer Registers o Common Bus System • Computer Instructions o Instruction Set Completeness • Timing and Control • Instruction Cycle	2
		o Fetch and Decode o Determine the Type of Instruction o Register-Reference Instructions • Memory-Reference Instructions • Input-Output and Interrupt • Complete Computer Description • Design of Basic Computer • Design of Accumulator Logic	2

	Central Processing Unit • Introduction • General Register Organization • Stack Organization • Instruction Formats • Addressing Modes • Data Transfer and Manipulation • Program Control	3 3	
4	**Organization of Input-Output and Memory**	**10**	
	Input-Output Organization • Peripheral Devices • Input-Output Interface • Asynchronous Data Transfer o Handshaking • Modes of Transfer • Priority Interrupt • Direct Memory Access	2 3	
	Memory Organization • Memory Hierarchy • Main Memory • Auxiliary Memory • Associative Memory • Cache Memory • Virtual Memory	2 3	

TEXT BOOK/S:

Text Book:
Computer System Architecture (3rd Edition)
By: M. Morris Mano
Publisher: Pearson

REFERENCE BOOKS:

1. Computer Architecture and Organization (2nd Edition), By: B. Govindrajalu, Publisher: TMH

WEB RESOURCES:

https://www.tutorialspoint.com/computer_logical_organization/index.htm
https://en.wikipedia.org/wiki/Computer_architecture
http://nptel.ac.in/courses/106103068/#
http://www.srmuniv.ac.in/downloads/computer_architecture.pdf
https://imlearner.files.wordpress.com/2010/08/computer-system-architecture-3rd-ed-morris-mano-p98.pdf
http://www.a-zshiksha.com/forum/viewtopic.php?f=133&t=61511
https://docs.google.com/file/d/0B0DfyDcYZ0AbeFlhdmo3cy1udVk/edit
https://docs.google.com/uc?id=0B0DfyDcYZ0AbN2tzZEhRcEF1a1k&export=download
https://robot.bolink.org/ebooks/Computer%20System%20Architecture%203e%20By%20M%20Morris%20Mano.pdf
https://books.google.co.in/books/about/Computer_Architecture_and_Organization.html?id=YT74AkSrj4sC
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