Program	BACHELOR OF VOCATION (B.Voc.)	**Semester - 3**
Type of Course	-	
Prerequisite		
Rationale	-	
Effective From A.Y.	2024-25	

Teaching Scheme (Contact Hours)				Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
Lecture	Tutorial	Lab	Credit	SEE T	IAT	SEE P	CCE	
3	1	-	4	50	-	-	20	70

***SEE** - Semester End Examination, **IAT** - Internal Assessment Test, **CCE** - Continues & Comprehensive Evaluation*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Fundamentals of Computer Organization and Register Transfer** Introduction to computer organization and architecture, Functional components of a computer: CPU, Memory, I/O, Buses, Data representation: Number systems, Binary arithmetic, Fixed point and floating-point representation, Register Transfer Language (RTL) Bus and memory transfers (Tri-state bus buffers, memory transfer)	9	20
2	**Basic Computer Organization, Design, and Microoperations** Instruction codes and formats, Computer registers, Computer instructions and their types, Timing and control, Instruction cycle, Design of a basic computer, Arithmetic microoperations, Logic and shift microoperations	9	20
3	**ALP and Microprogrammed Control Organization** Machine language, Assembly language programming: Arithmetic and logic operations, Subroutines, I/O programming. Control memory, Address sequencing, Micro program example, Design of a control unit	7	20
4	**Central Processing Unit, Pipelining, and Computer Arithmetic** Introduction, General register organization, Stack organization, Instruction format, Addressing modes, Data transfer and manipulation, Program control, Reduced Instruction Set Computer (RISC) & Complex Instruction Set Computer (CISC), Flynn's taxonomy, Parallel processing, Pipelining, Arithmetic pipeline, Instruction pipeline, RISC pipeline, Vector processing, Array processors, Addition and subtraction, Multiplication Algorithm, Booth multiplication algorithm	10	20
5	**Input-Output and Memory Organization** I/O interface, Asynchronous data transfer, Modes of transfer, Priority interrupt, DMA, IOP, CPUIOP communication, Memory hierarchy, Main memory, Auxiliary memory, Associative memory, Cache memory, Virtual memory	10	20
	Total	45	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy			
Level	Remembrance	Understanding	Application
Weightage	10	20	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand the basic structure and functional components of a computer system and analyze data representation methods and register-level operations
CO2	Understand instruction formats, types, and the execution cycle, and demonstrate the design and microoperations of a basic computer
CO3	Develop simple assembly language programs and understand the concepts of microprogrammed control and control unit design
CO4	Illustrate CPU organization, various instruction formats, addressing modes, and analyze pipelining and arithmetic operations in modern processors
CO5	Explain the operation of input-output systems and I/O data transfer techniques, and explore memory hierarchy and memory management in computing systems

Reference Books

1.	**Computer Architecture and Organization (TextBook)** By J. P. Hayes | McGraw-Hill Education
2.	**Computer System Architecture** By M. Morris Mano | Pearson Education
3.	**Computer Organization and Architecture** By William Stallings | Prentice Hall of India
4.	**Structured Computer Organization** By Andrew S. Tanenbaum | 6/E, PHI EEE
5.	**Computer Organization** By Carl Hamacher, Zvonko Vranesic, Safwat Zaky | 5/E, McGraw-Hill, Pub. Year 2002